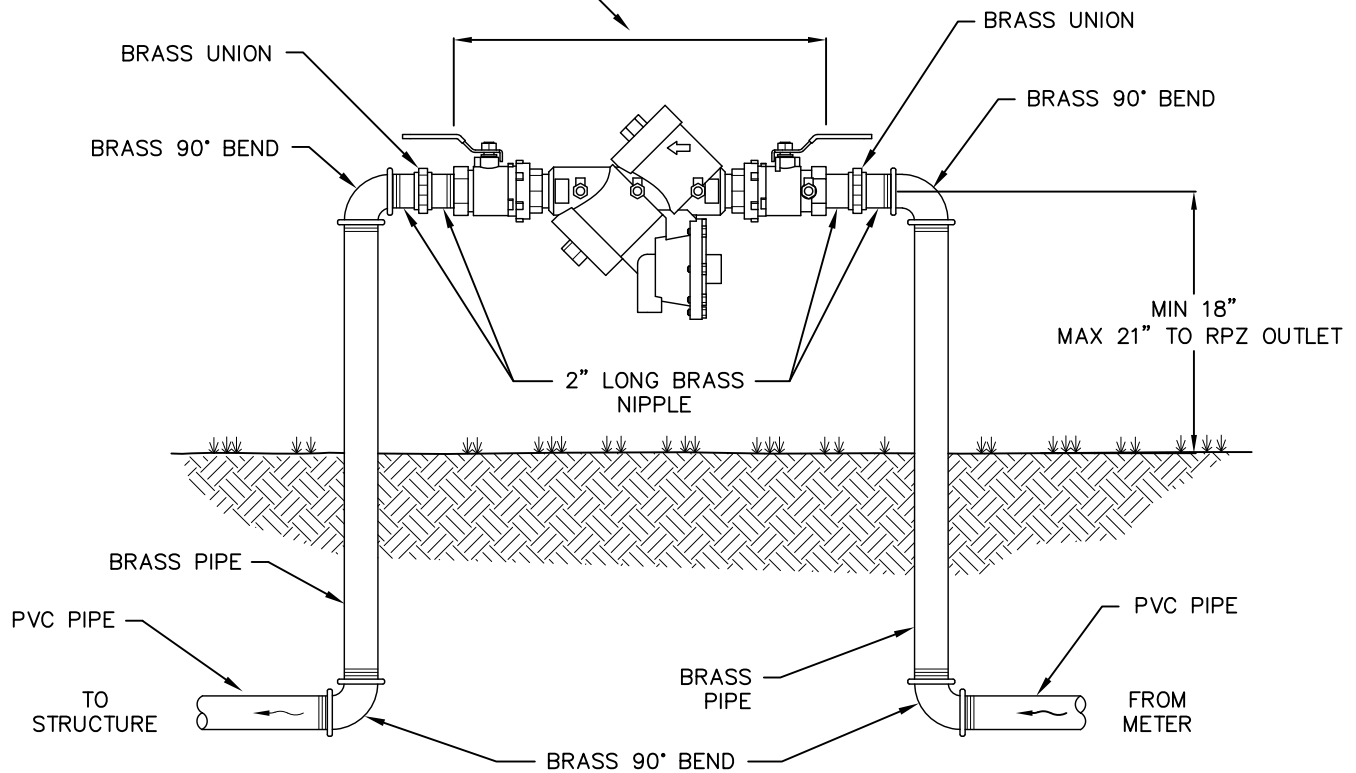


NOTES:

1. THE CONTRACTOR SHALL CONTACT THE UTILITIES INSPECTOR FOR EXACT METER ASSEMBLY LENGTH AND HEIGHT REQUIREMENTS. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL PIPE, FITTINGS, METER ASSEMBLY AND APPURTENANCES. ALL ABOVE GROUND PIPE SHALL BE FLANGED DUCTILE IRON, PRIMER COATED ONLY.
2. ALL FLANGES: PIPE, VALVES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH VCU'S LIST OF MATERIAL AND APPROVED MANUFACTURES.
3. FINISH GRADE AROUND METER ASSEMBLY SLAB SHALL ENSURE A SAFE WORK ENVIRONMENT. GRADING SLOPE DROP OFF SHALL NOT EXCEED 6-IN WITHIN 5-FT OF SLAB.
4. SENSUS OMNI METER WITH RADIO READ CAPABILITY
5. F-2 STRAINER REQUIRED FOR FIRE FLOW
6. PIPE SUPPORT TO BE BOLTED TO THE FLANGE. PIPE SUPPORTS APPLY TO ENTIRE ABOVE-GROUND ASSEMBLY, INCLUDING THE MAIN AND BYPASS PIPING.
7. FOR RECLAIMED WTER METERS, BYPASS AND BACKFLOW PREVENTER NOT REQUIRED.
8. BOLLARDS REQUIRED AT DISCRETION OF VOLUSIA COUNTY.

4" AND LARGER MASTER METER ASSEMBLY WITH ABOVE-GROUND BYPASS

BACKFLOW PREVENTER FURNISHED, INSTALLED
AND MAINTAINED BY PROPERTY OWNER.

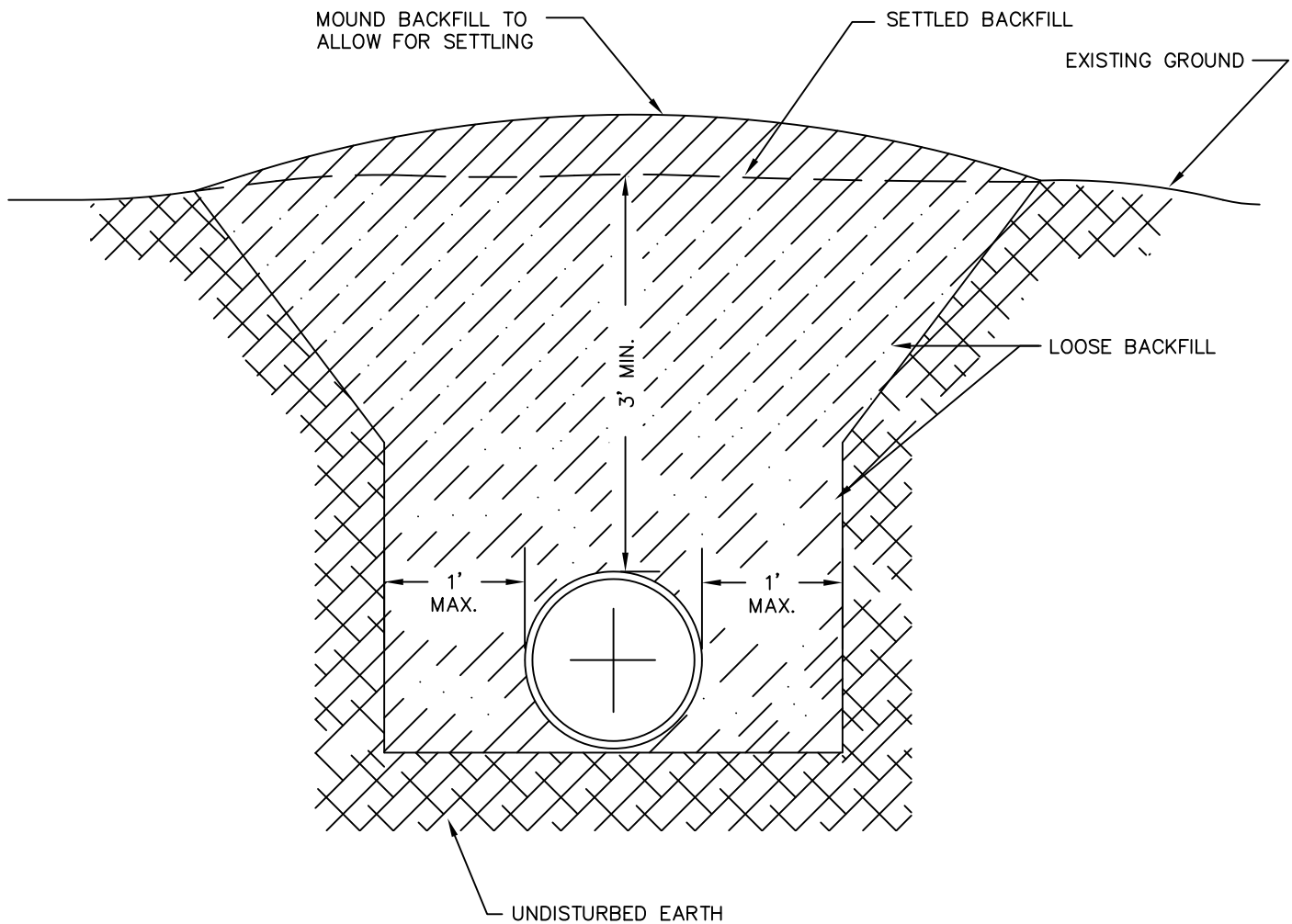


NOTES

1. SENSUS METER TO BE SUPPLIED BY COUNTY.

3/4\" TO 1.5\" BACKFLOW PREVENTER

NTS

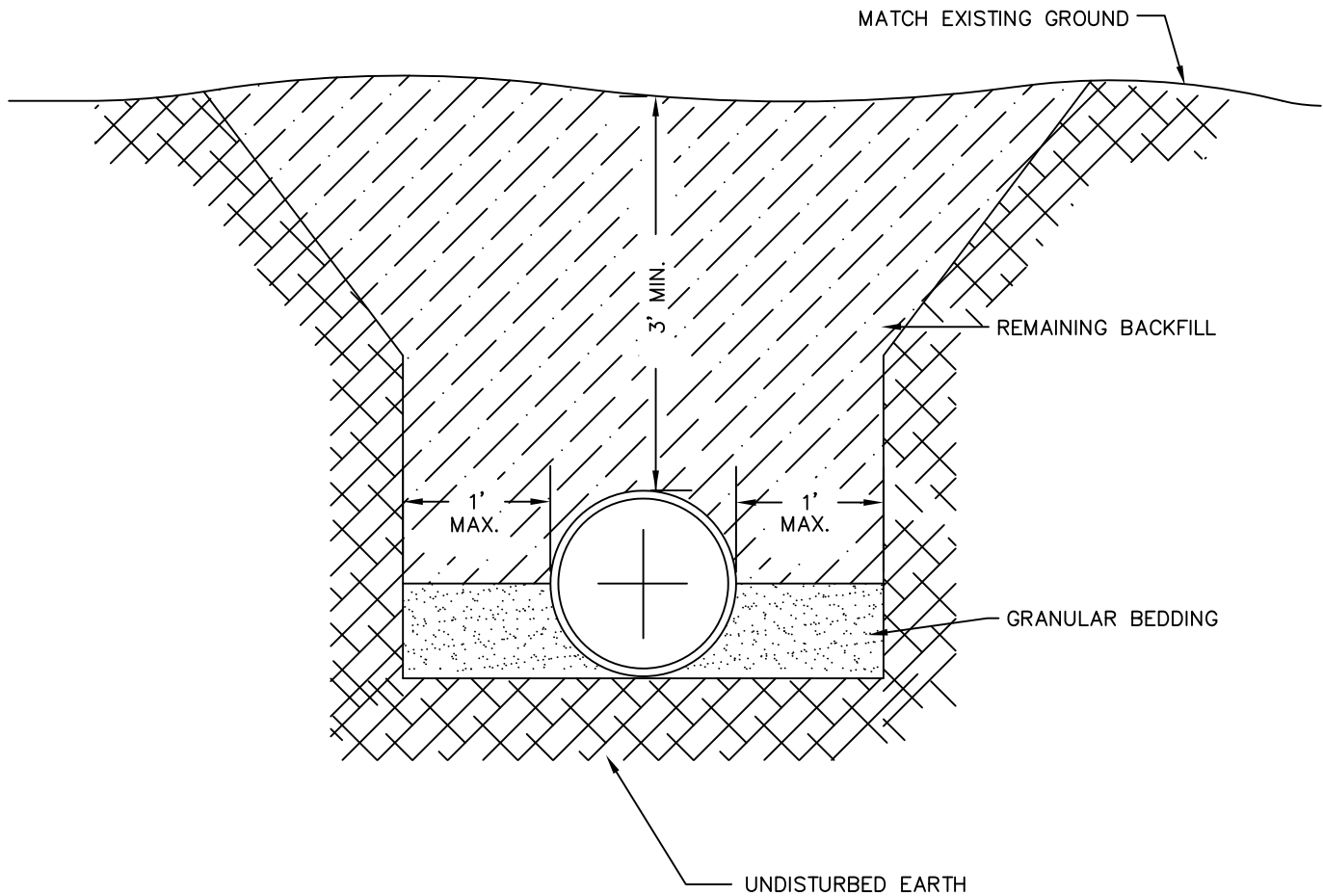


NOTES

1. PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH BY UNDISTURBED EARTH. DIG OUT HOLLOW AT PIPE BELL.
2. TRENCH SHALL BE DRY DURING PLACEMENT
3. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, STICKS, ROOTS & OTHER DEBRIS.
4. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED GREATER THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.
5. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 98% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED LESS THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.

TYPICAL TYPE I TRENCH DETAIL

(GRANULAR SOILS)

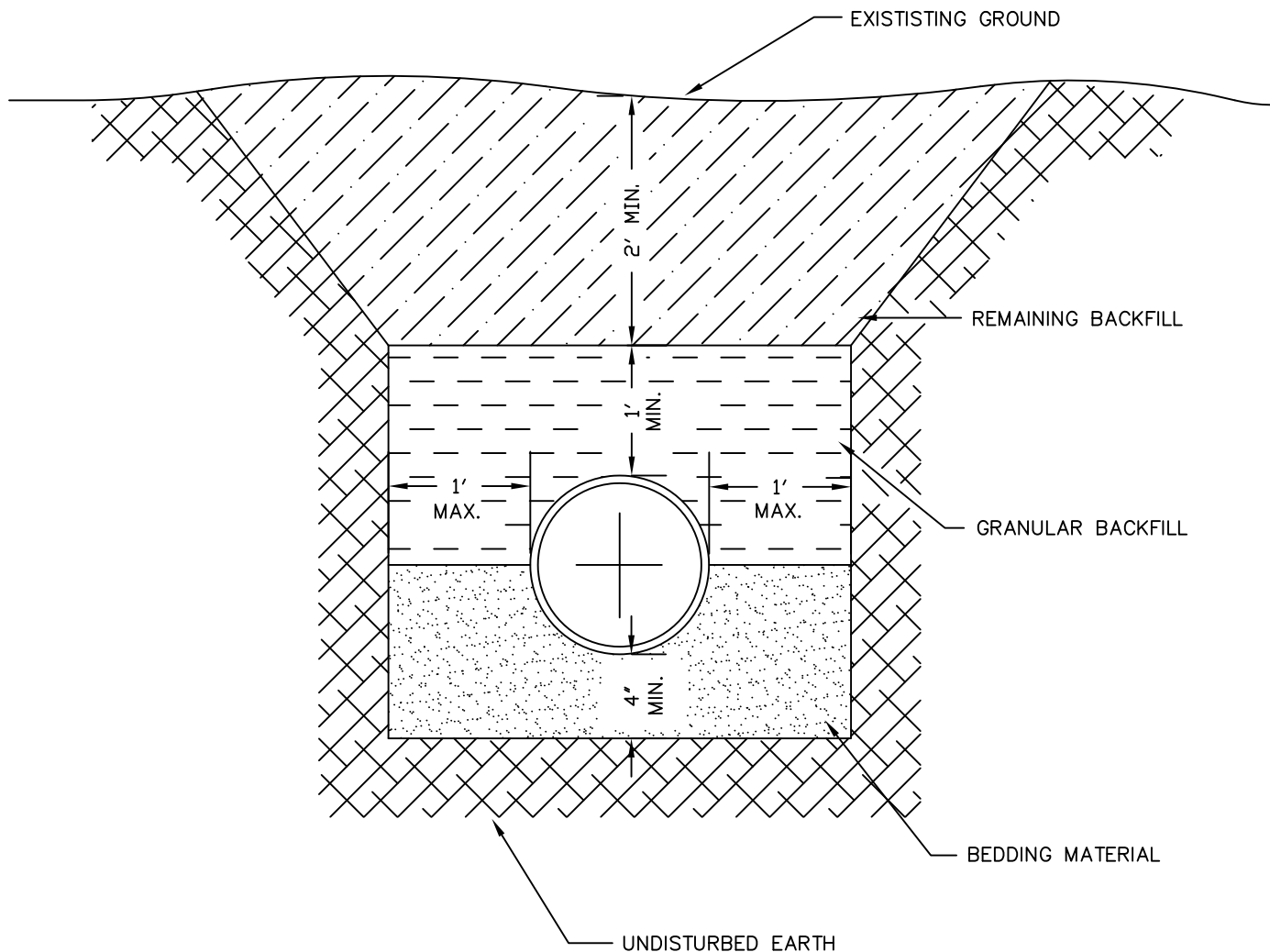


NOTES

1. PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER PIPE HAUNCHES.
2. TRENCH SHALL BE DRY DURING PLACEMENT
3. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, STICKS, ROOTS & OTHER DEBRIS.
4. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED GREATER THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.
5. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 98% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED LESS THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.

TYPICAL TYPE 2 TRENCH DETAIL

(SILTS AND CLAYS)

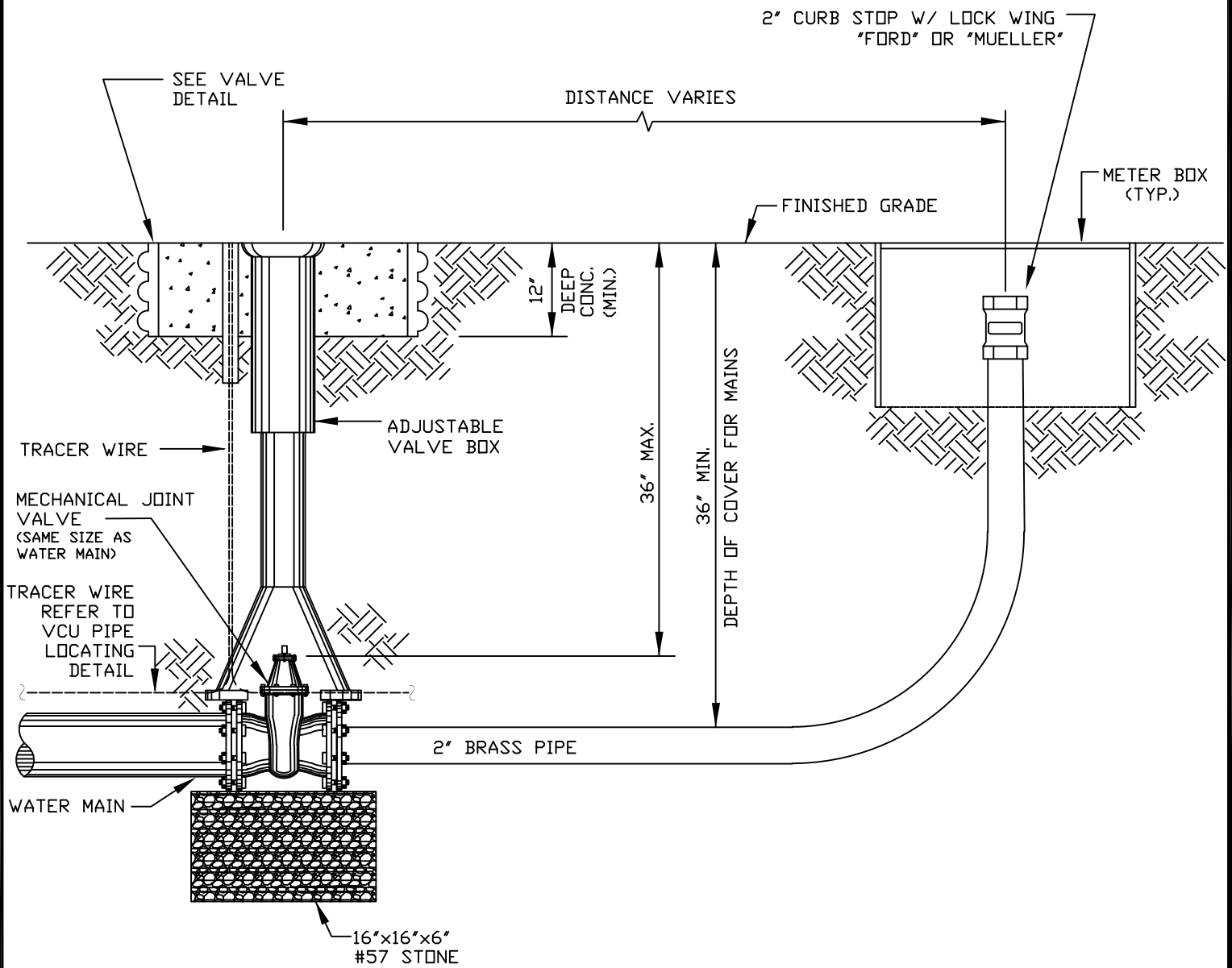


NOTES

1. PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER PIPE HAUNCHES.
2. TRENCH SHALL BE DRY DURING PLACEMENT
3. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, STICKS, ROOTS & OTHER DEBRIS.
4. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED GREATER THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.
5. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 98% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED LESS THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.

TYPICAL TYPE 3 TRENCH DETAIL

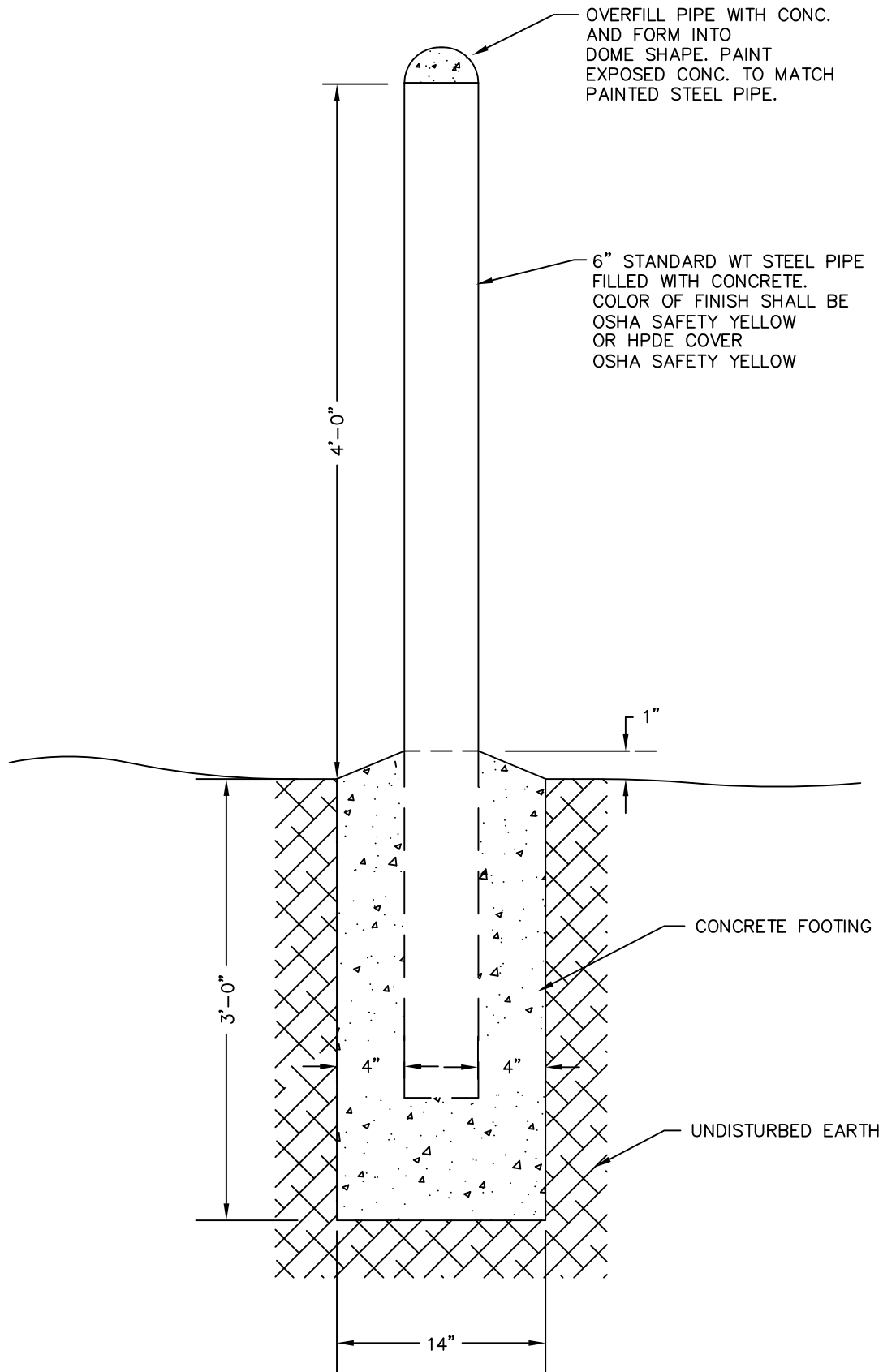
(HIGHLY ORGANIC
SOILS "PEAT")



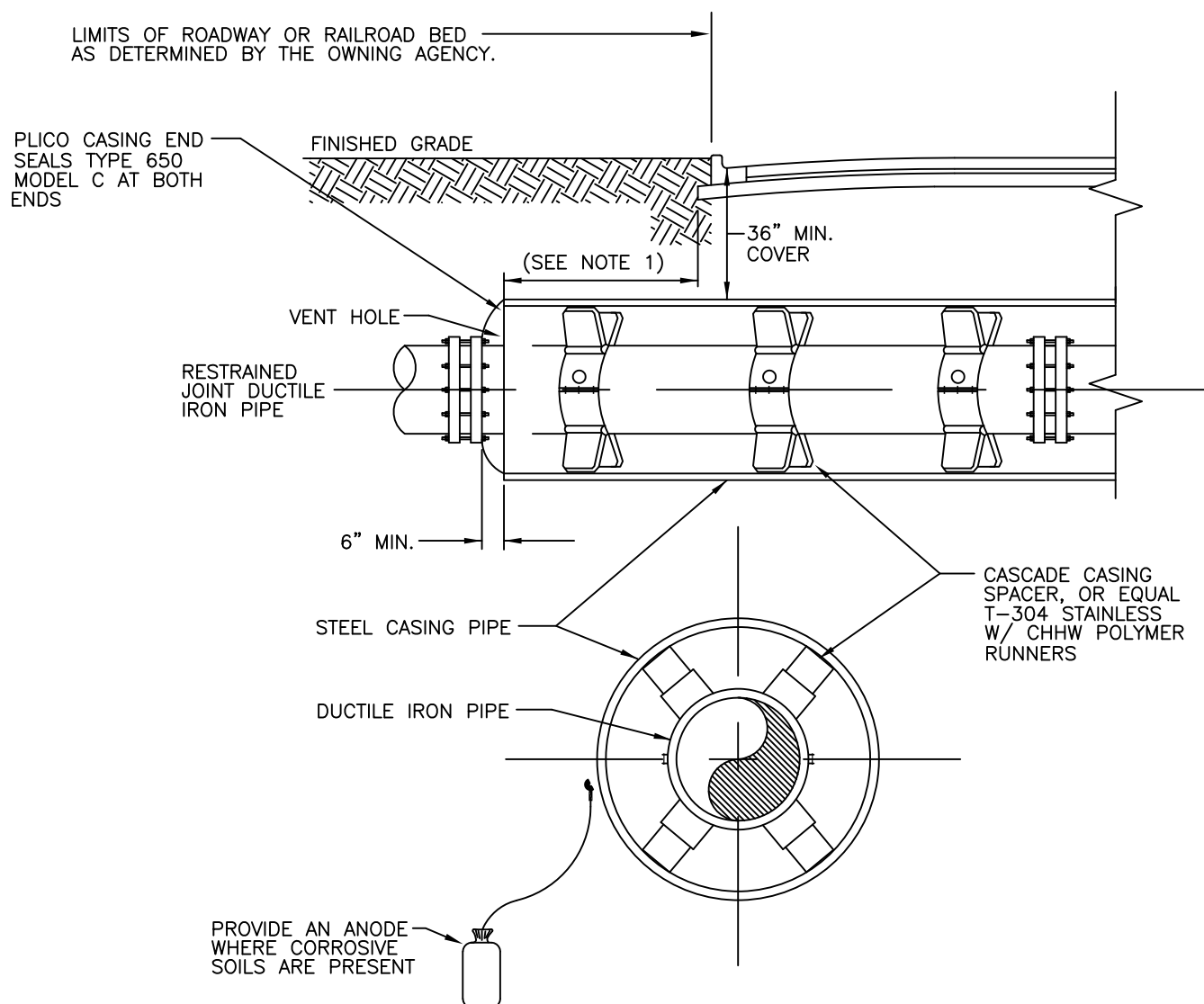
NOTES: 1. ALL CURB STOPS TO HAVE LOCK WINGS

BLOW-OFF DETAIL

NTS



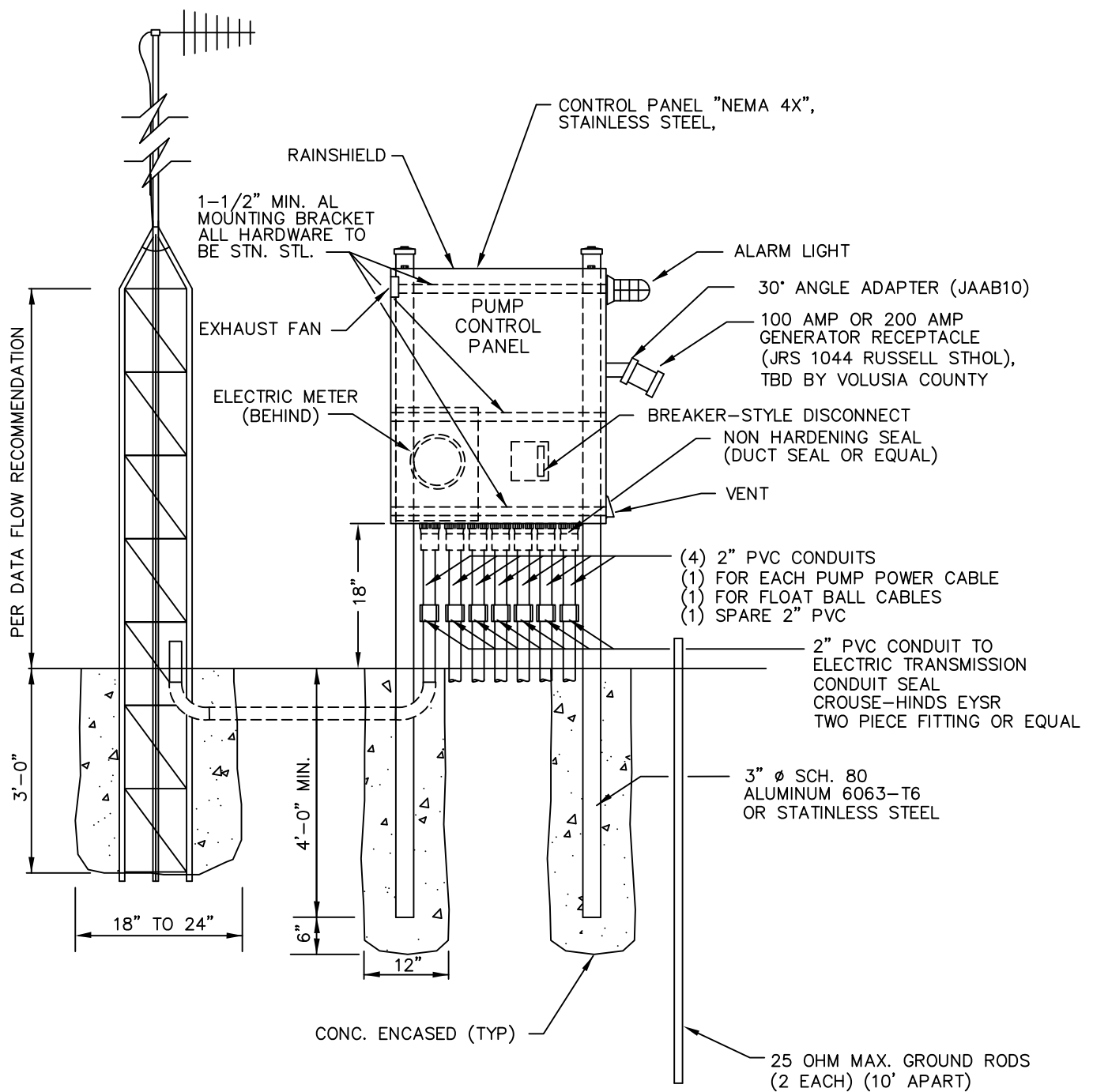
BOLLARD DETAIL



NOTES:

1. DEPTH OF COVER AND CASING EXTENSION BEYOND PAVEMENT OR R/R TRACKS SHALL BE AS REQUIRED BY THE REGULATORY AUTHORITY. ON COUNTY ROADS WHERE PRACTICAL, CASING SHALL EXTEND 8' BEYOND EDGE OF PAVEMENT AND SHALL NOT BE LESS THAN 6' BEYOND EDGE OF PAVEMENT IN ANY CASE.
2. CASING SPACERS AND END SEALS TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. STEEL CASING PIPE MATERIAL, SIZE AND COATINGS SHALL BE AS REQUIRED BY F.D.O.T.
4. LOCATE WIRE AND LOCATE TAPE (TWO TYPES) SHALL BE ON ALL PARTS.

BORE AND JACK CASING INSTALLATION DETAIL

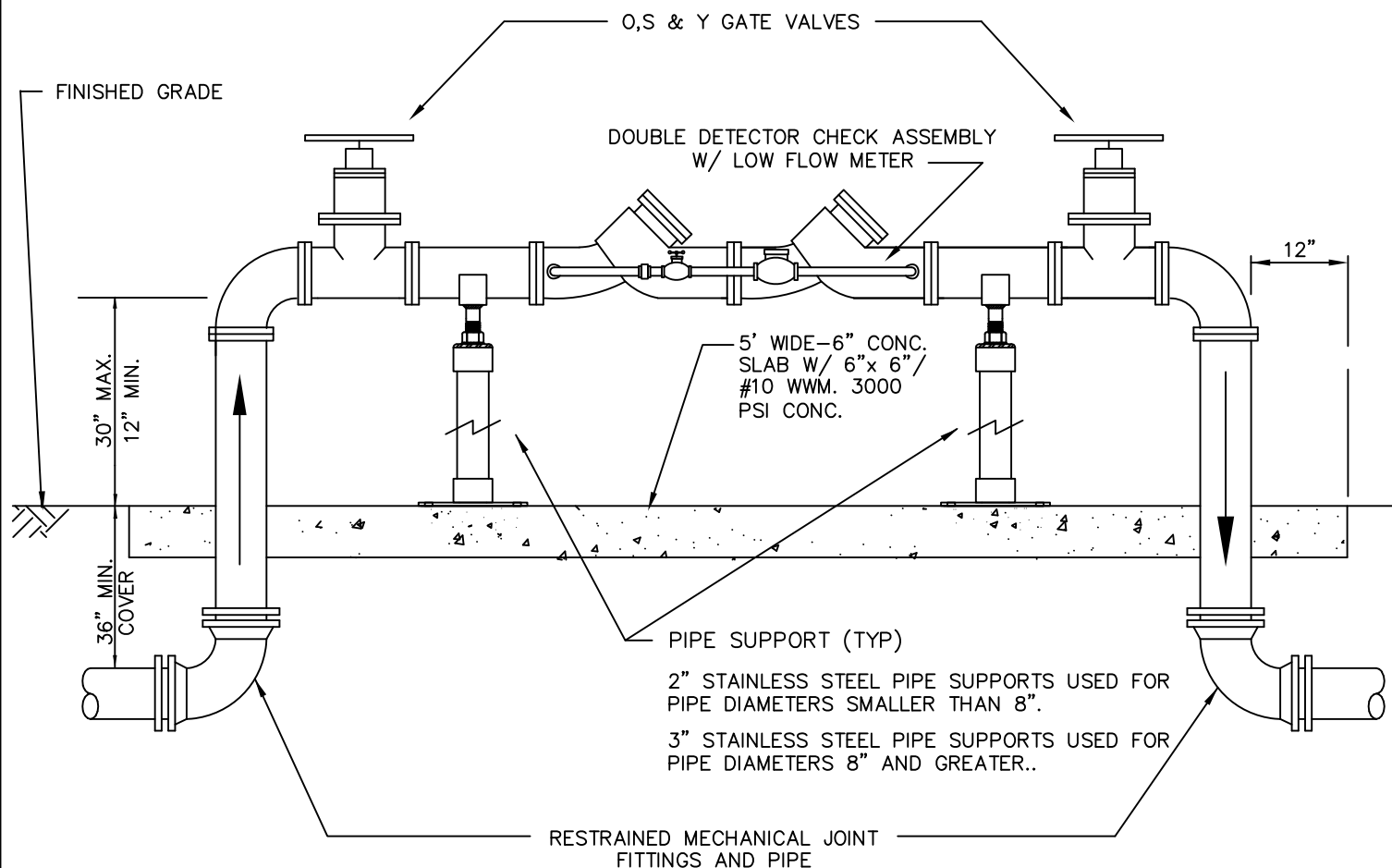


NOTES

1. DRAWING IS SHOWN FOR 230 VOLT POWER SUPPLY. THE ELECTRICAL UTILITY SHALL DETERMINE THE SERVICE CONFIGURATION.
2. POWER SUPPLY SHALL BE UNDERGROUND ON THE LIFT STATION SITE AND SHALL BE 3 PHASE FROM A 3 PHASE SOURCE ONLY.

CONTROL PANEL/ ANTENNA ELEVATION

N.T.S.



- NOTES:
1. ALL PIPE & FITTINGS ABOVE GRADE SHALL BE FLANGED
 2. ALL PIPING, FITTINGS AND SUPPORTS TO BE PAINTED. COLOR TO BE SELECTED BY COUNTY.
 3. DOUBLE DETECTOR CHECK ASSEMBLY SHALL HAVE A FUSED EPOXY COATED CAST IRON BODY.
 4. ASSEMBLY SHALL BE EQUIPPED WITH A LOW FLOW METERING DEVICE TO DETECT LEAKS.

DOUBLE DETECTOR CHECK ASSEMBLY

FOR FIRE PROTECTION ONLY

Electronic Marker Balls for Gravity Mains

Electronic Balls shall be provided at one foot from the termination of all sanitary sewer service laterals. Balls shall be Scotchmark model 1404, Electronic Full-Range Marker manufactured by 3M.

Electronic Marker Balls for Sewer Force Mains

Electronic Balls shall be provided at fittings, valves, crosses, tees, changes in direction and every 100-ft on straight sections of pipe. Balls shall also be provided at the termination of sewer services. Electronic marker Balls shall be Scotchmark model 1404, Electronic Full-Range Marker Balls manufactured by 3M.

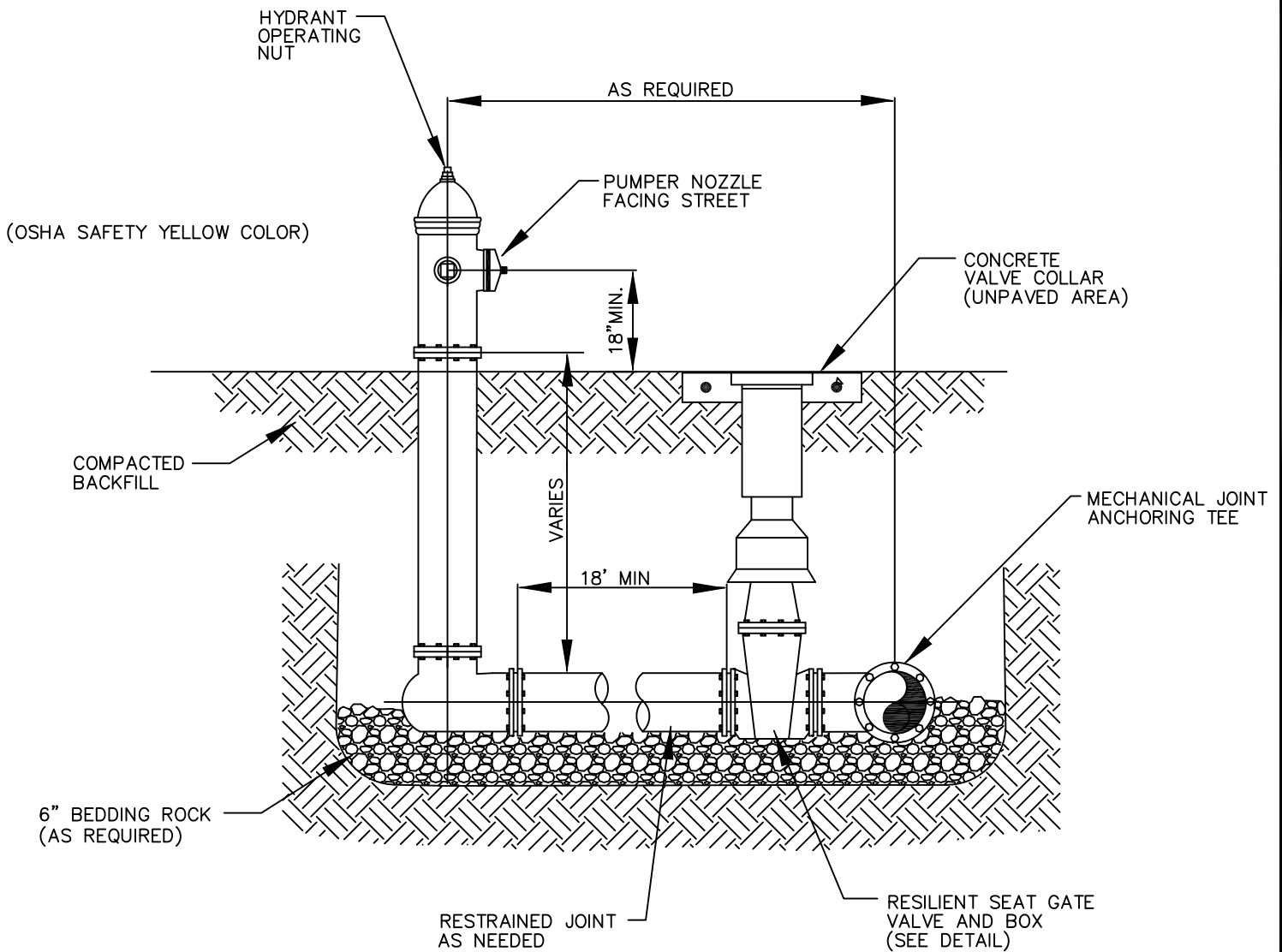
Electronic Marker Balls for Potable Water Mains

Electronic Balls shall be provided at fittings, valves, crosses, tees, changes in direction and every 100-ft on straight sections of pipe. Balls shall also be provided at the termination of water services. Balls shall be Scotchmark model 1403, Electronic Full-Range Marker Balls manufactured by 3M.

Electronic Marker Balls for Reclaimed Water Mains

Electronic Balls shall be at fittings, valves, crosses, tees, changes in direction and every 100-ft on straight sections of pipe. Balls shall also be provided at the termination of water services. Balls shall be Scotchmark model 1408, Electronic Full-Range Marker Balls manufactured by 3M.

ELECTRONIC MARKER

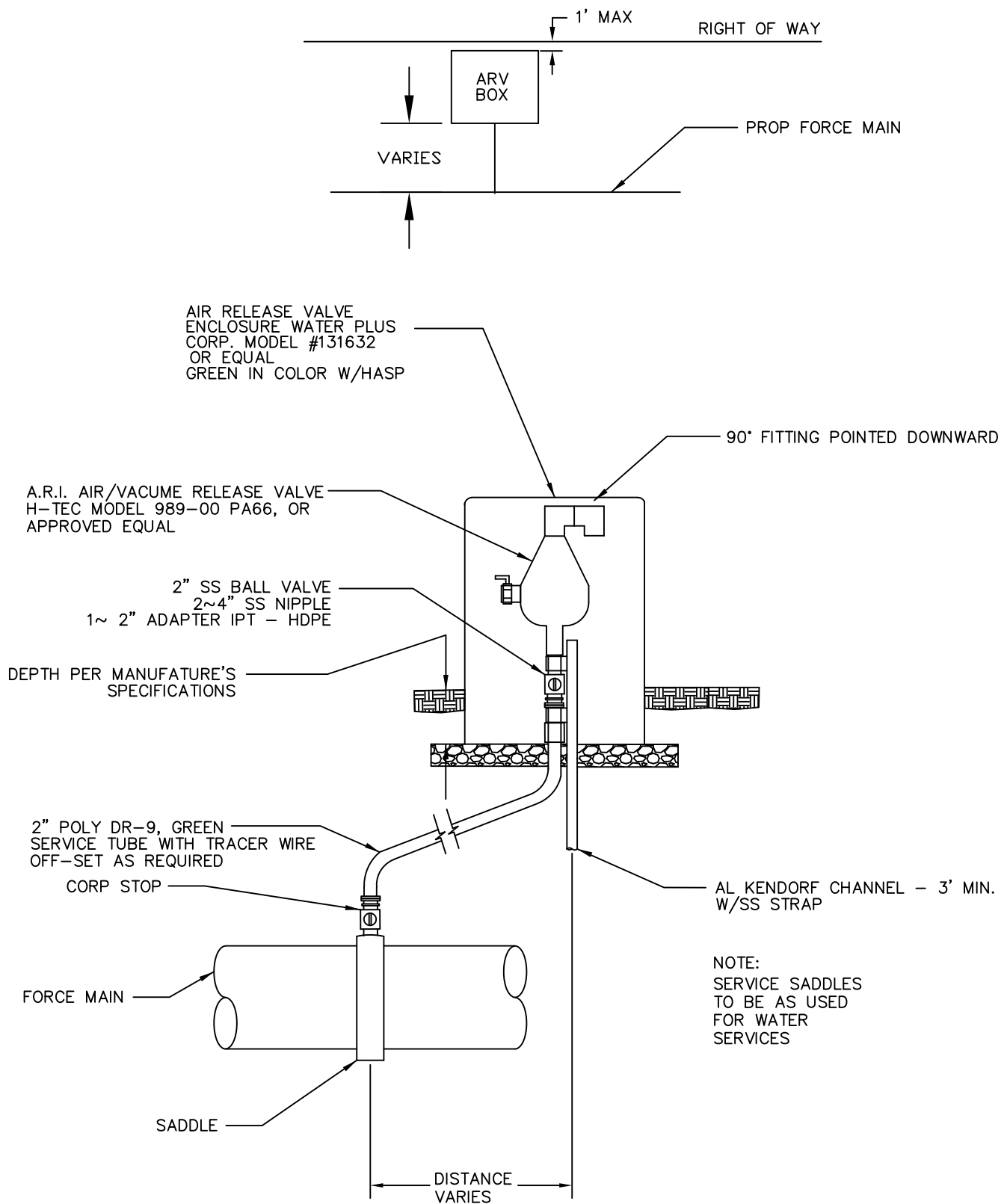


NOTES:

1. FIRE HYDRANT TO BE LOCATED 5' TO 10' FROM EDGE OF PAVEMENT.
2. VALVE BOX SHALL BE SCREW TYPE ADJUSTABLE AND COVER SHALL BE MARKED: WATER.
3. FIRE HYDRANTS CANNOT BE LOCATED WITHIN THE RADIUS OF STREET CORNERS.
4. ABOVE GROUND OBSTRUCTIONS MAY BE LOCATED NO CLOSER THAN 3' FROM FIRE HYDRANTS.
5. FIRE HYDRANT SHALL BE SUPPLIED WITHOUT WEEP HOLE, OR WITH A PERMANENTLY PLUGGED WEEP HOLE.
6. FIRE HYDRANT SHALL COMPLY VOLUSIA COUNTY SPECIFICATIONS, APPENDIX A, LIST OF APPROVED MANUFACTURERS AND MATERIALS.
7. ALL FIRE HYDRANT PIPING SHALL BE RESTRAINED BY MEGA-LUGS.
8. LOCATE WIRE AND LOCATE TAPE SHALL BE INSTALLED ON ALL PIPES.
9. A BLUE REFLECTOR SHALL BE INSTALLED ON THE PAVEMENT ADJACENT TO THE FIRE HYDRANT.

FIRE HYDRANT ASSEMBLY DETAIL

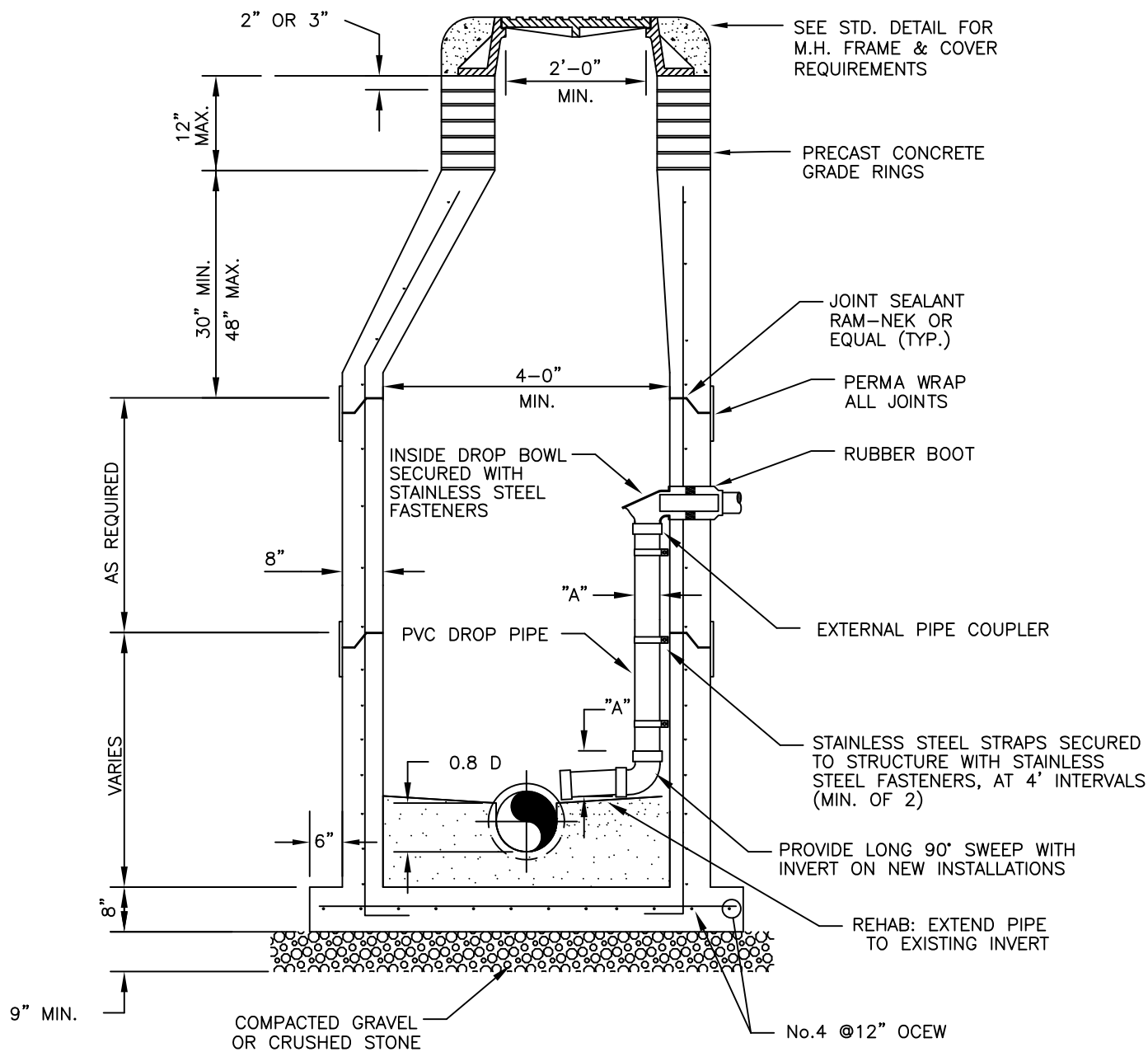
N.T.S.



SANITARY FORCE MAIN AIR AND VACUUM RELEASE VALVE

ARI D-025
OR EQUAL

NTS

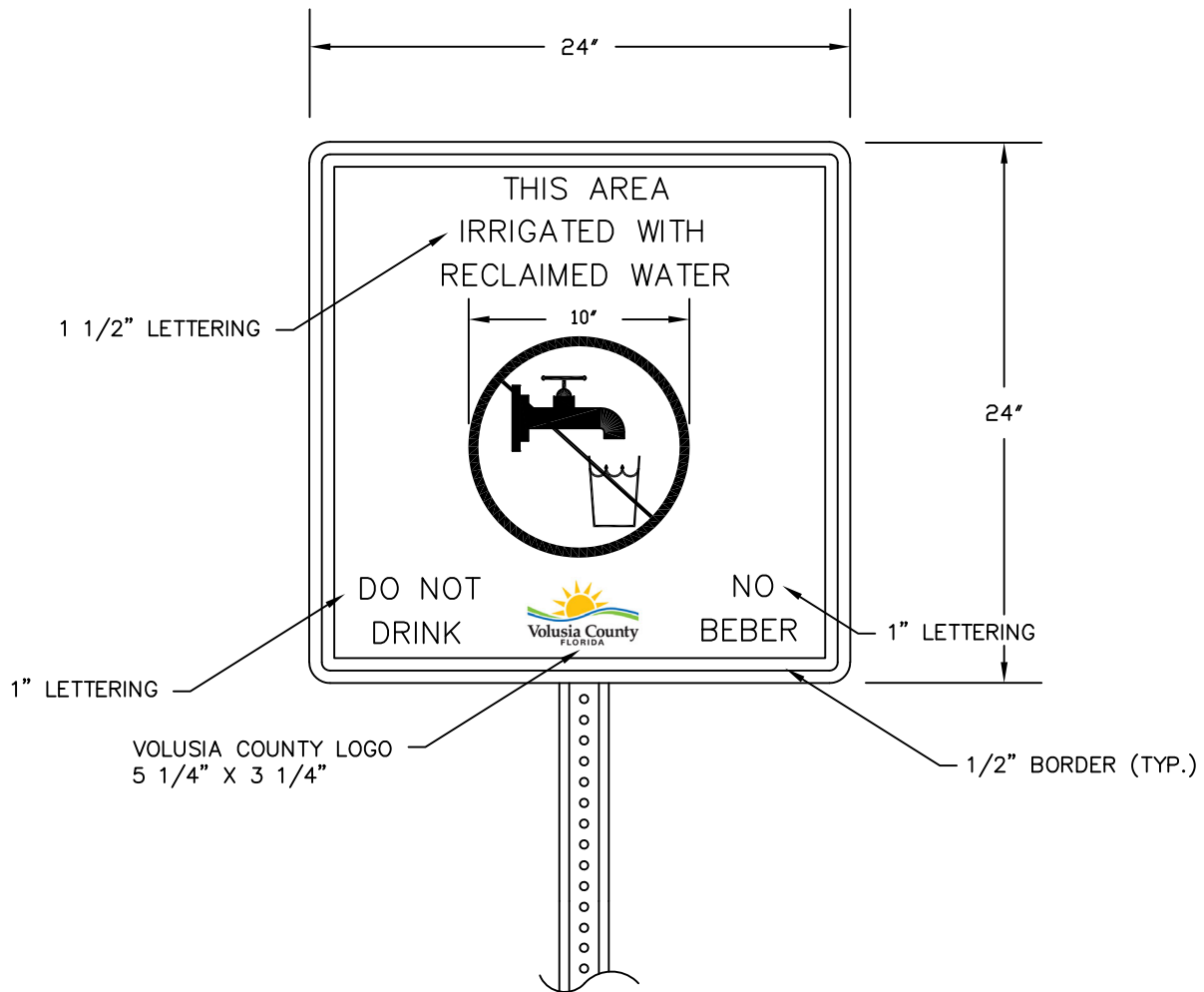


NOTES:

1. FOR FORCE MAIN CONNECTION, ADD COVER TO INSIDE DROP BOWL.

INSIDE DROP DETAIL

FOR NEW INSTALLATIONS AND RETROFIT
OF EXISTING MANHOLES/WET WELLS



NOTES

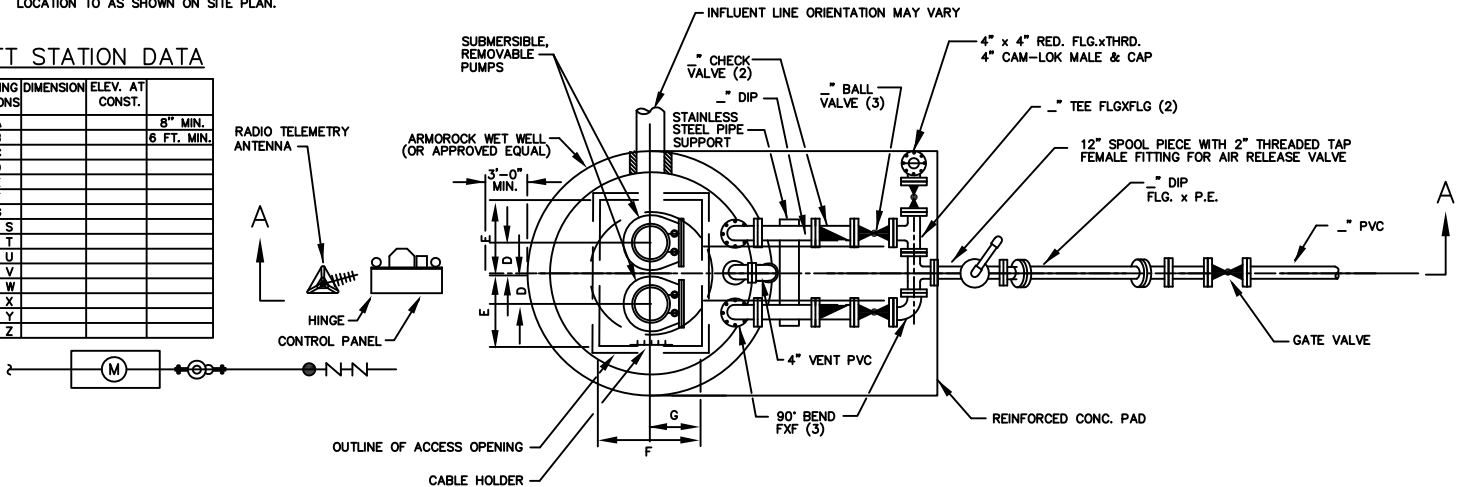
1. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE VISIBLE TO THE PUBLIC.
2. SIGN LETTERS AND GRAPHIC SYMBOLS SHALL BE "PANTONE PURPLE" COLOR OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
3. BACKGROUND SHALL BE REFLECTIVE COLORED "WHITE" OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
4. POST SHALL BE U CHANNEL, 2 LB. HOT ROLLED HIGH TENSILE RAIL OR OR BILLET STEEL WITH GALVANIZED FINISH PER ASTM A-123.
5. MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
6. MINIMUM DEPTH OF BURIAL OF SIGN POST SHALL BE 4'.
7. SIGN BLANK SHALL BE REFLECTIVE ALUMINUM 0.080" THICK.
8. VOLUSIA COUNTY LOGO SHALL NOT BE A DECAL.

IRRIGATED WITH RECLAIMED WATER SIGN

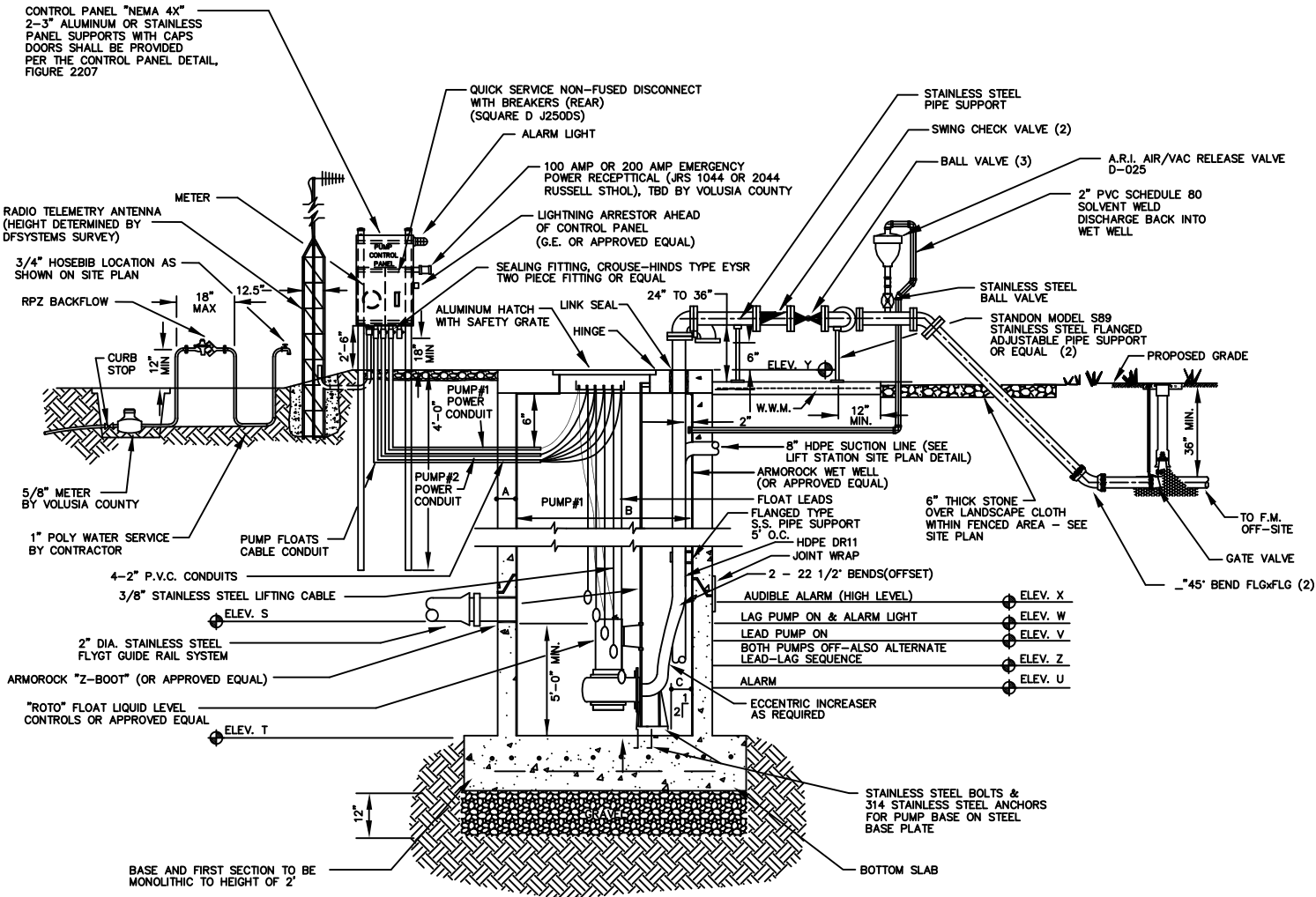
CONTRACTOR TO FURNISH 1" POLY-TUBE WATER SERVICE AND BOX. COUNTY TO FURNISH METER.
CONTRACTOR TO FURNISH 3/4" HOSE BIBB.
LOCATION TO AS SHOWN ON SITE PLAN.

LIFT STATION DATA

PUMPING STATIONS	DIMENSION	ELEV. AT CONST.
DIM A		8" MIN.
DIM B		6 FT. MIN.
DIM C		
DIM D		
DIM E		
DIM F		
DIM G		
ELEV. S		
ELEV. T		
ELEV. U		
ELEV. V		
ELEV. W		
ELEV. X		
ELEV. Y		
ELEV. Z		



PLAN
NOT TO SCALE



PUMP DATA

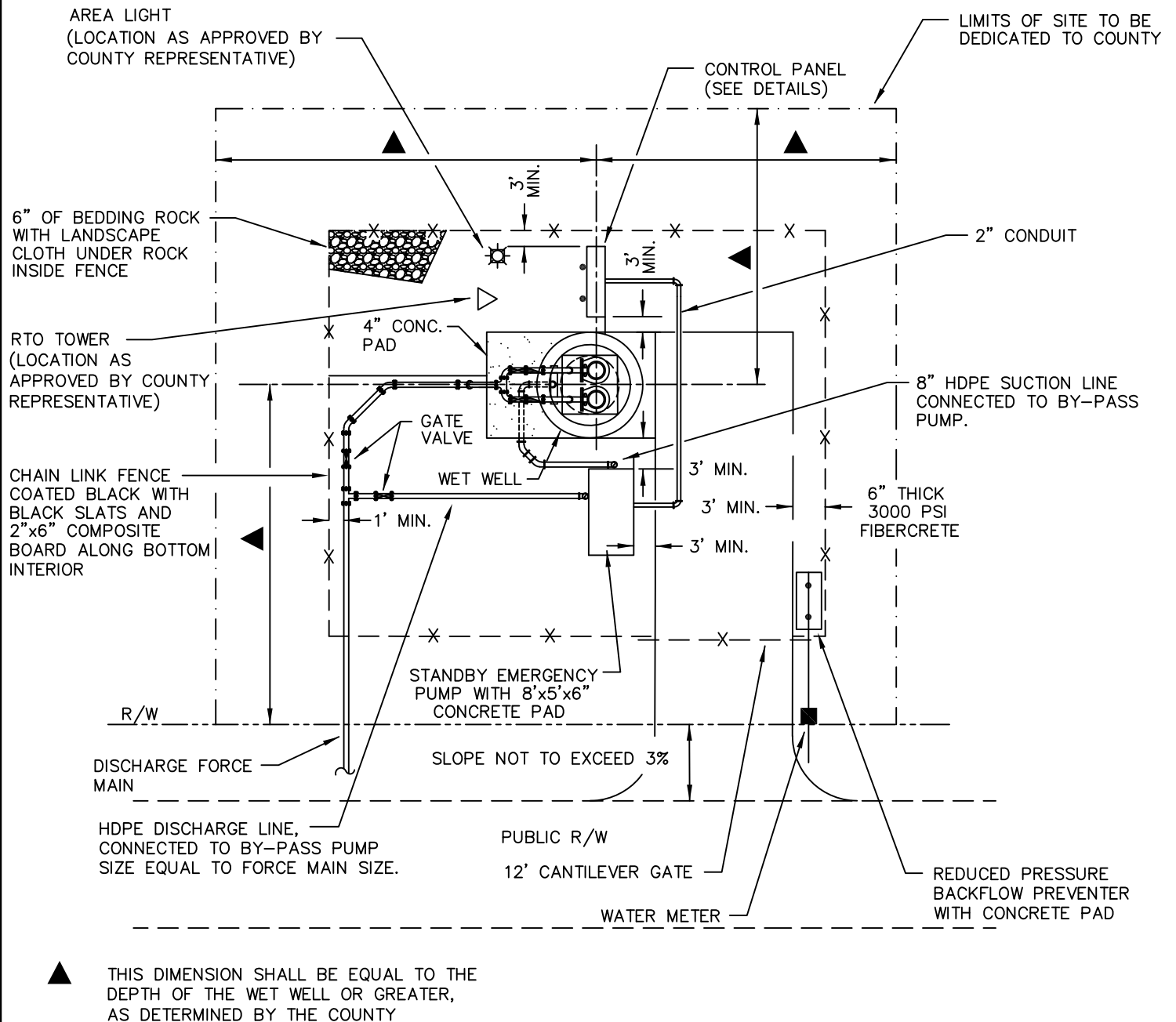
MANUFACTURER:	MODEL:
IMPELLER NO.:	NOMINAL SIZE:
SPEED:	1750 RPM
VOLTAGE:	230/460
HORSEPOWER:	MIN. SOLID SIZE: 3"
OPERATING CONDITIONS SHALL BE _____ GPM @ _____ THD.	
MIN. SHUT OFF HEAD _____ FT.	

SECTION A-A
NOT TO SCALE

LIFT STATION DETAIL

1. THE LIFT STATION SHALL BE DESIGNED IN ACCORDANCE WITH SECTIONS 61–63 OF VOLUSIA COUNTY’S UTILITY SPECIFICATIONS, AVAILABLE ONLINE AT www.volusia.org/core/fileparse.php/4157/urlt/UtilitySpecifications_032714.pdf
2. SHOP DRAWINGS ARE REQUIRED FOR PUMPS, PIPING, VALVES, FITTINGS, ELECTRICAL EQUIPMENT AND PRE–CAST CONCRETE STRUCTURES.
3. ALL PRECAST STRUCTURES SHALL BE DESIGNED PER ACI 315 & 318 “MANUAL OF STANDARD PRACTICE”.
4. ALL EXPOSED METAL, EXCLUDING STAINLESS STEEL OR ALUMINUM MATERIALS, SHALL BE PAINTED WITH (2) COATS OF EXTERIOR, OIL BASE, ENAMEL PAINT. PIPING SHALL COME WITH STD. RED PRIMER.
5. WET WELL SHALL BE ARMOROCK OR APPROVED EQUAL AND REQUIRES JOINT WRAP TAPE.
6. WET WELL ACCESS HATCHES SHALL BE MINIMUM 36”x 48”, 1/4” THICK ALUMINUM FLOOR PLATE REINFORCED TO 150 P.S.F. LIVE LOAD. DOORS SHALL HAVE FLUSH ALUMINUM DROP HANDLE AND AN AUTOMATIC HOLD OPEN ARM WITH RELEASE HANDLE. ALL FASTENERS AND ACCESSORIES SHALL BE 316 STAINLESS STEEL. HATCH FRAMES TO BE INTEGRALLY CAST INTO CONCRETE TOPS. THE HATCHES SHALL BE SERIES W1R WITH A SERIES X RETRO–GRATE MANUFACTURED BY “HALLIDAY”, OR APPROVED EQUAL.
7. ALL NUTS, BOLTS, WASHERS AND MISCELLANEOUS HARDWARE ARE TO BE 316 STAINLESS STEEL.
8. THE CONTRACTOR SHALL COORDINATE WITH THE POWER COMPANY. FOR ELECTRICAL SERVICE TO THE LIFT STATION SITE, AND SHALL MEET ALL POWER COMPANY REQUIREMENTS WITHOUT ADDITIONAL COMPENSATION.
9. ALL WET WELL JOINTS TO BE SEALED WITH “RAM–NEK” JOINT SEALER AND WRAPPED WITH 8” WIDE JOINT TAPE ON THE OUTSIDE PERIMETER.
10. ALL EXPOSED AND EMBEDDED CONDUITS TO BE PVC.
11. TESTING OF FORCE MAIN AND LIFT STATION SHALL BE REQUIRED. LIFT STATION SHALL BE TESTED WITH FIRST PUMP ON, SECOND PUMP ON, AND BOTH PUMPS ON.
12. ALL M.J. AND FLANGED D.I. PIPE AND FITTINGS SHALL BE POLYETHYLENE LINED (40 MILS. NOMINAL) CONFORMING TO ASTM D–1248.
13. ALL SUPPORTS AND HARDWARE FOR ELECTRICAL EQUIPMENT SHALL BE PVC COATED ALUMINUM OR STAINLESS STEEL.
14. THE ENTIRE AREA WITHIN THE SECURITY FENCE SHALL HAVE A MINIMUM OF 6” STONE OVER LAYER OF LANDSCAPE CLOTH.
15. THE LIFT STATION SHALL BE EQUIPPED WITH DATA FLOW SYSTEMS PUMP CONTROLS AND TELEMETRY EQUIPMENT. THE DATA FLOW SYSTEM CONTROLLER SHALL BE EQUIPPED WITH A TRANSMITTER AND ANTENNA CAPABLE OF COMMUNICATING WITH THE COUNTY’S S.W. WATER RECLAMATION FACILITY, AS WELL AS CONFORMING TO VOLUSIA COUNTY DATA FLOW STANDARDS.

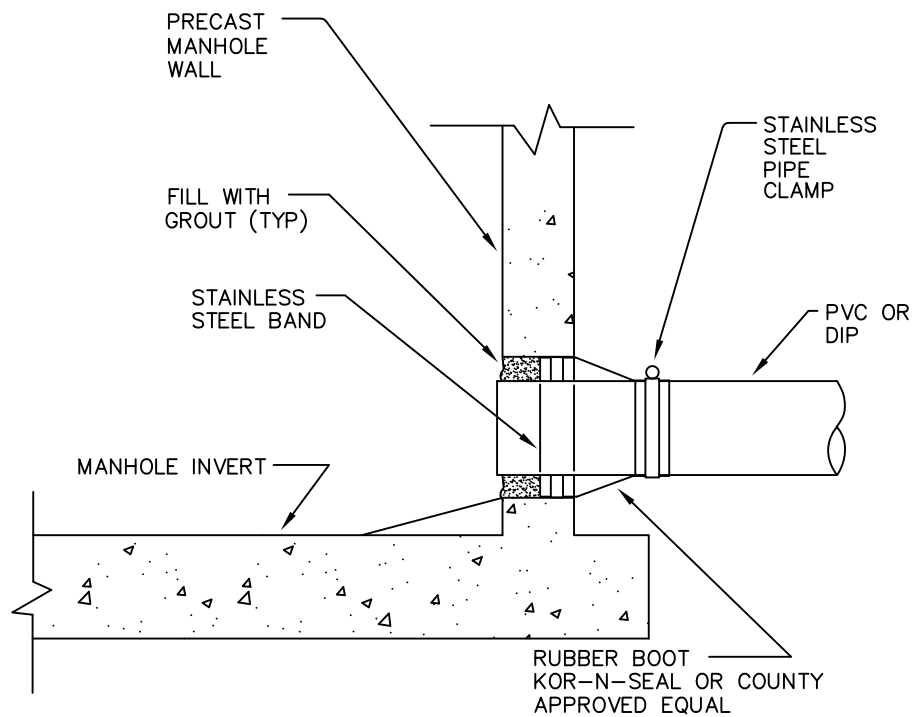
LIFT STATION NOTES



NOTES:

1. SEE LIFT STATION DETAIL SHEET FOR EQUIPMENT AND STRUCTURE DESIGN.
2. ENGINEER SHALL PROVIDE A SCALED (1"=20' MIN.) SITE SPECIFIC DETAIL.
3. THE HOA OR OTHER PRIVATE ENTITY SHALL BE RESPONSIBLE FOR MAINTENANCE IF LANDSCAPING IS INSTALLED.
4. LIFT STATION SITE TO BE GRADED TO DRAIN AWAY FROM WET WELL.
5. DRIVEWAY AND GENERATOR PAD FINISHED ELEVATION TO BE 0.1 TO 0.2 FEET BELOW TO OF WET WELL WITHIN FENCED AREA, WITH POSITIVE DRAINAGE AWAY FROM WET WELL.
5. GRADING OF SITE OUTSIDE OF FENCE SHALL NOT EXCEED 4:1 SLOPE.

LIFT STATION SITE PLAN

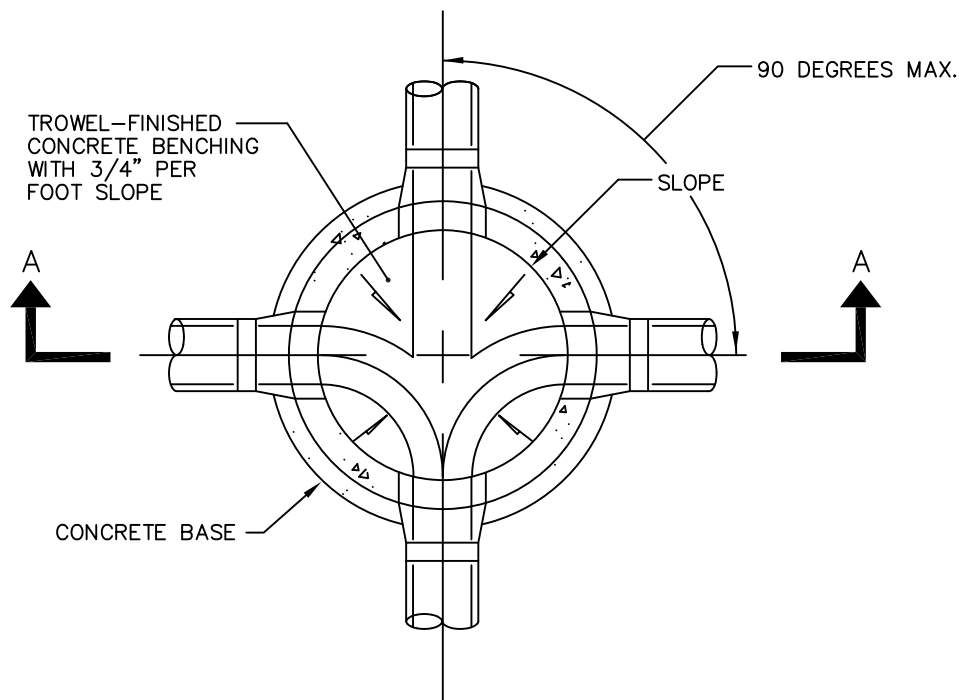


STANDARD PRECAST MANHOLE
PIPE CONNECTION

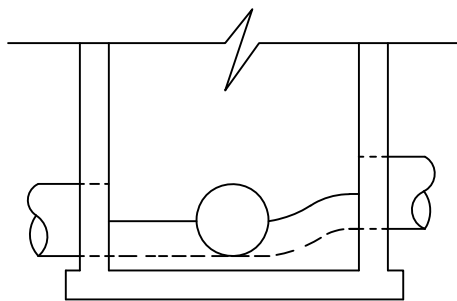
NOTES:

1. DROP PIPE AND FITTINGS SHALL BE OF EQUAL SIZE AND MATERIAL AS THE INFLUENT SEWER.
2. AN INSIDE DROP CONNECTION SHALL BE REQUIRED FOR ALL INFLUENT WHICH HAVE AN INVERT 18" OR MORE ABOVE THE MANHOLE INVERT.

MANHOLE CONNECTION DETAILS



PLAN VIEW

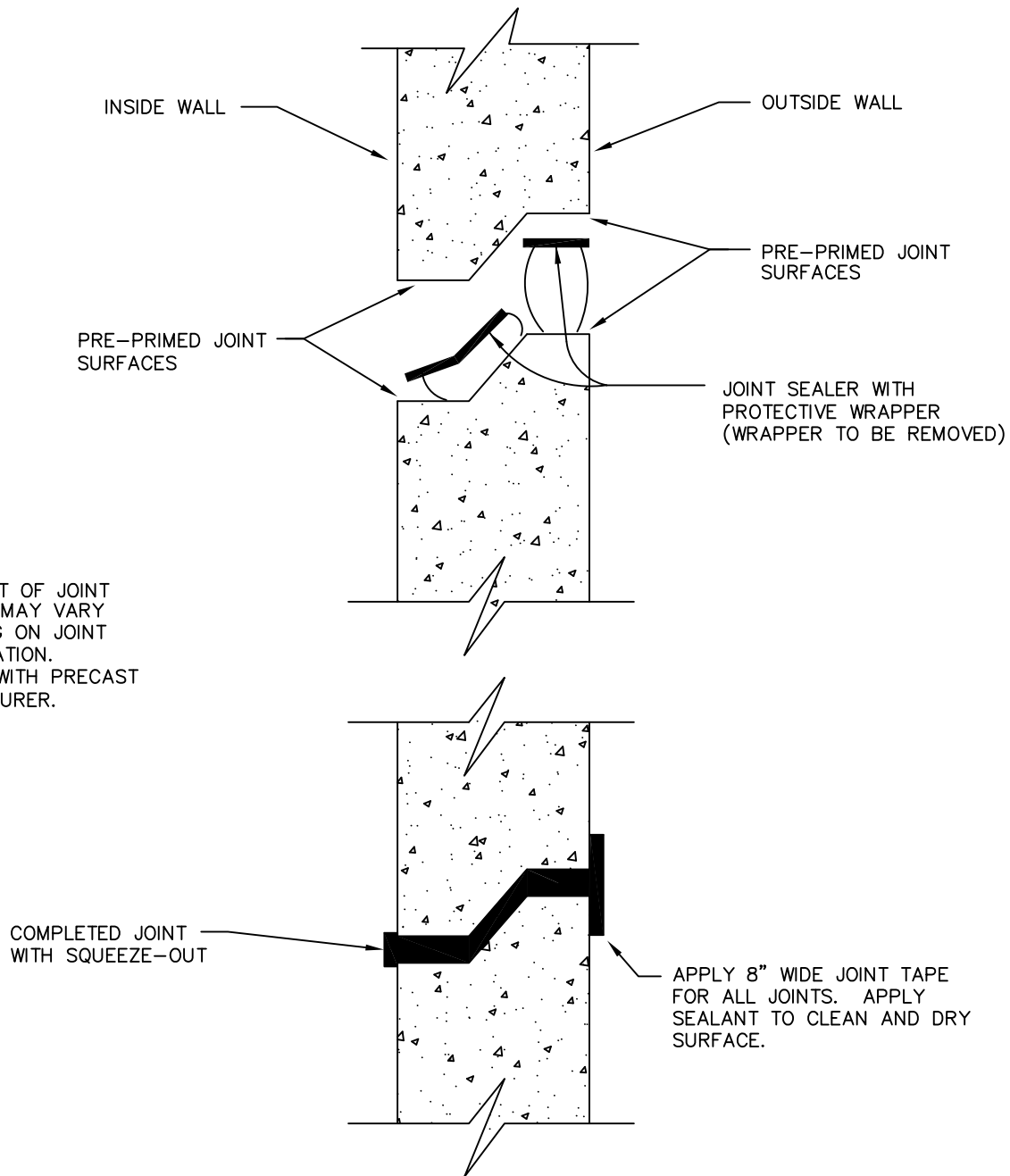


SECTION

NOTES

1. FLOW CHANNELS SHALL HAVE A MINIMUM SLOPE OF 0.40 FEET PER 100 FEET. NO STANDING WATER WILL BE PERMISSABLE.
2. ALL INVERT CHANNELS SHALL BE CONSTRUCTED TO OBTAIN A SMOOTH FLOW WITHOUT OBSTRUCTIONS.
3. SERVICE LATERALS SHALL NOT ENTER MANHOLES UNLESS SPECIFIED ON PLANS AND THEN MUST BE CONNECTED AS MAINS.
4. BRICK AND CONCRETE SHALL BE USED FOR FLOW CHANNEL BUILD UP.
5. SIDE OF FLOW CHANNEL SHALL BE AT LEAST HALF OF PIPE HEIGHT AT ALL POINTS.
6. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
7. LATERAL PIES SHALL NOT ENTER THE MANHOLE AT ANGLES GREATER THAN 90 DEGREES TO THE FLOW LINE.

MANHOLE FLOW CHANNEL DETAIL



MANHOLE JOINT DETAIL **FOR PRECAST SECTIONS**

2" DIA. TOUCH READ HOLE
W/ 4 1/8 DIA. x 3/16 COUNT
BORE (8x)

4X 3/4 [19] X 4 [102]
PULL SLOT W/1/4 [6]
CENTER PIN

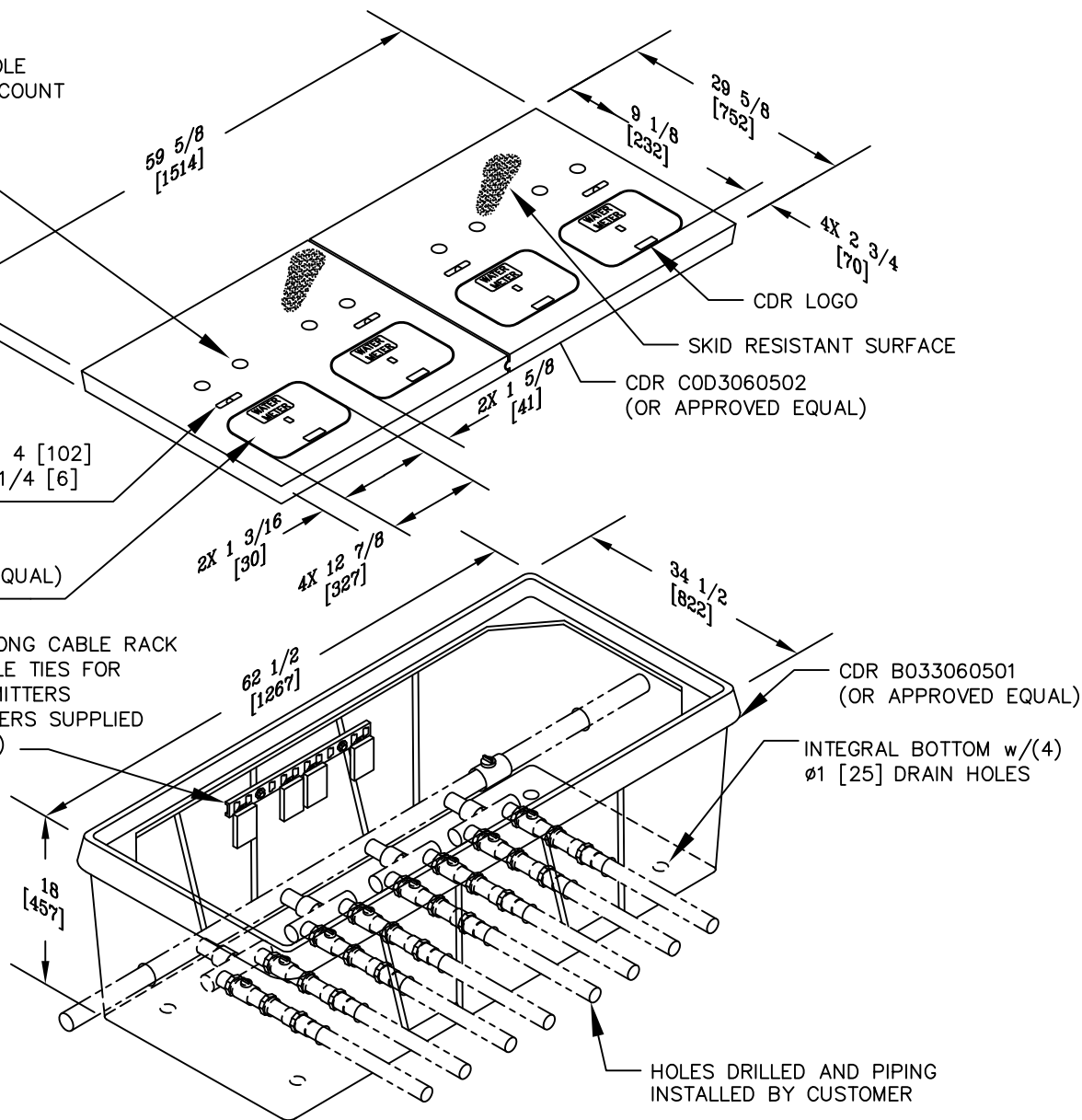
CDR C0710130A
(OR APPROVED EQUAL)
4 PLACES

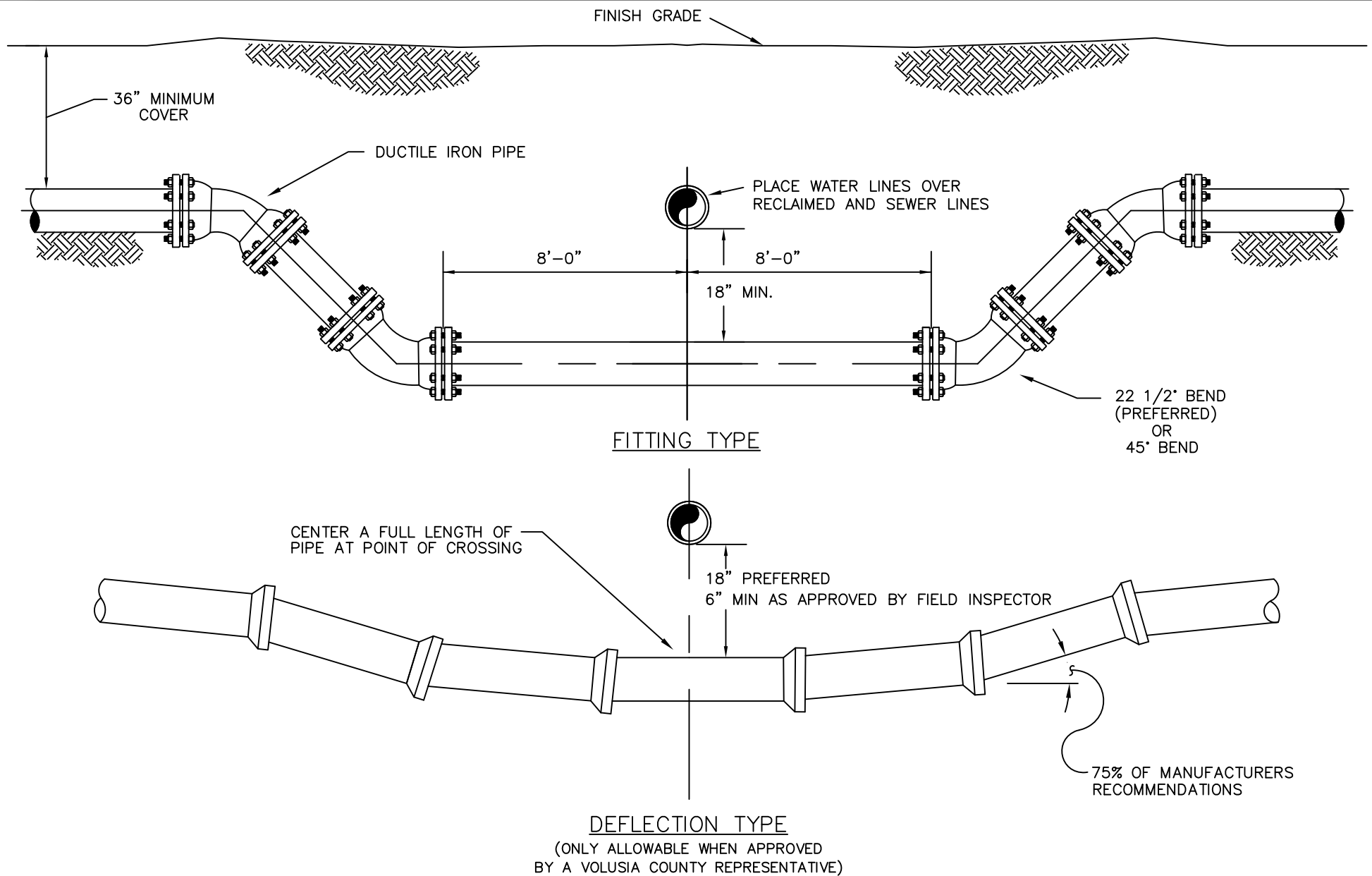
18 [457] LONG CABLE RACK
W/(4) CABLE TIES FOR
(4) TRANSMITTERS
(TRANSMITTERS SUPPLIED
BY OTHERS)

NOTE:

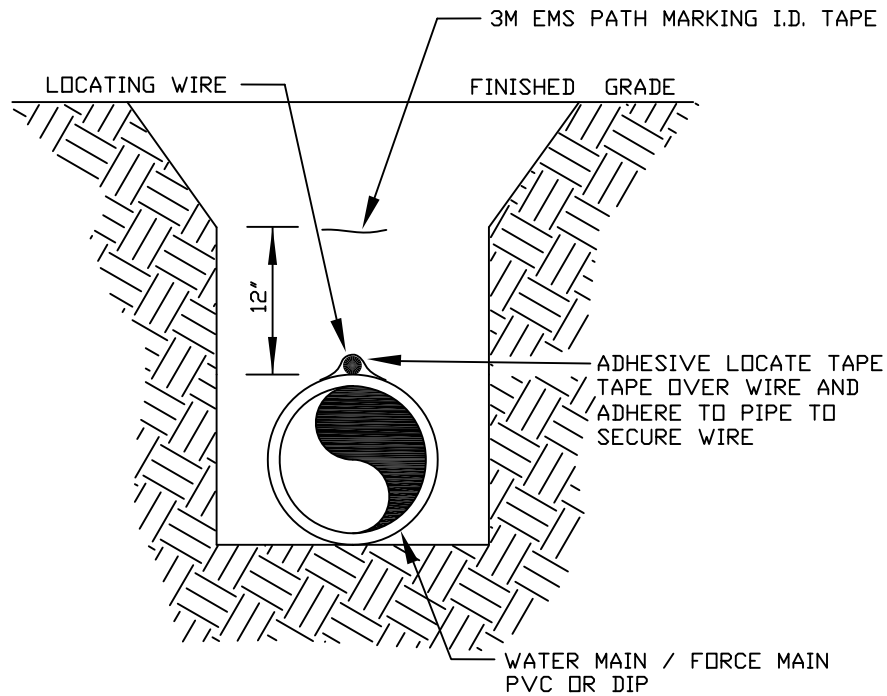
1. CDR 30 X 60 X 18 ASSEMBLY W/(4) 10X13 DROP-IN LIDS, & INTEGRAL BOTTOM

MULTIPLE METER VAULT WITH 4, 6 AND 8 METERS

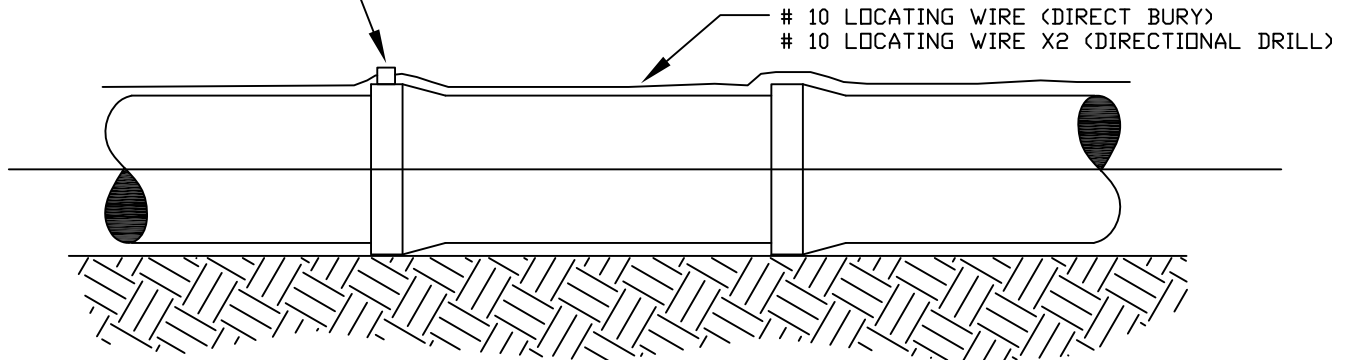




PIPE CONFLICT DETAIL



CONNECTORS SHALL BE SNAKE
BITE OR APPROVED EQUAL

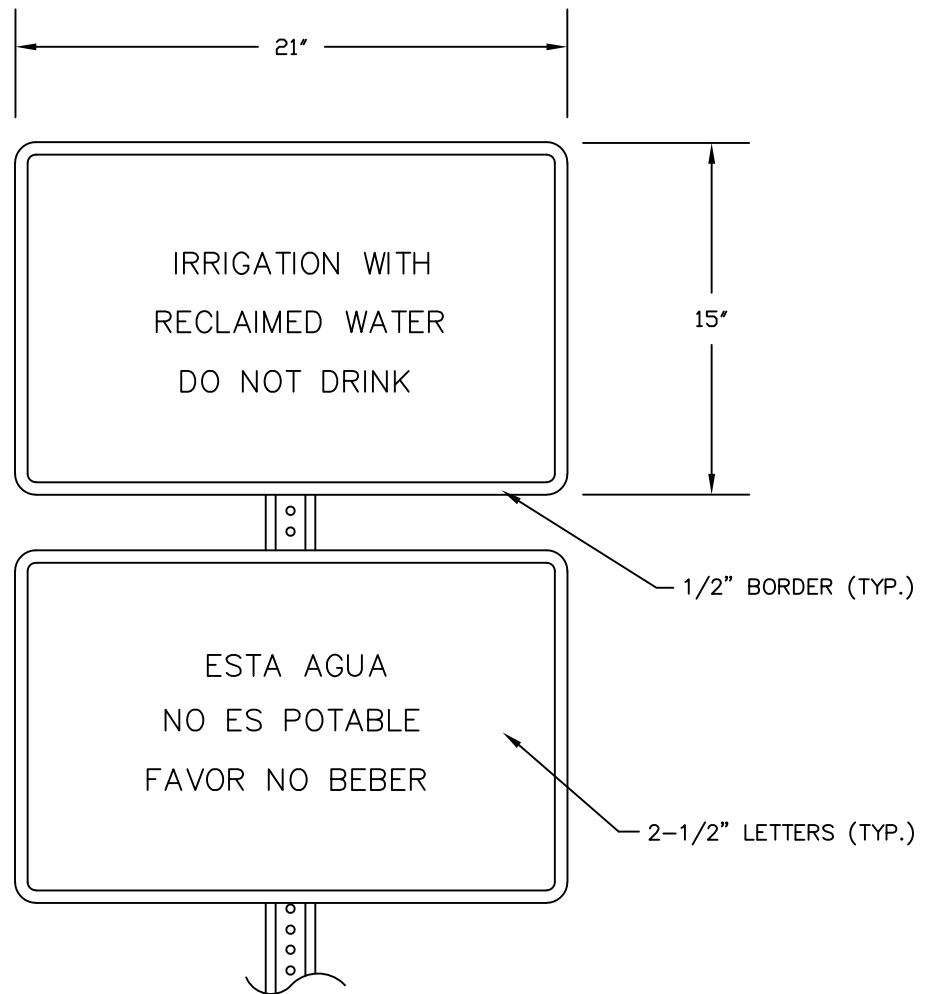


NOTES:

1. ALL PIPE SHALL REQUIRE INSULATED METALLIC SOLID LOCATING WIRE CAPABLE OF DETECTION BY A CABLE LOCATOR AND SHALL BE BURIED DIRECTLY ABOVE CENTERLINE OF PIPE.
2. LOCATING WIRE SHALL TERMINATE AT THE TOP OF EACH VALVE BOX AND BE CAPABLE OF EXTENDING 12" ABOVE TOP OF BOX IN SUCH A MANNER SO AS NOT TO INTERFERE WITH VALVE OPERATION (SEE GATE VALVE AND BOX DETAIL, FIGURE 2307).
3. ADHESIVE I.D. TAPE AS NECESSARY TO HOLD WIRE DIRECTLY ON THE TOP OF THE PIPE.
4. LOCATE WIRE AND LOCATE TAPE (TWO TYPES) SHALL BE ON ALL PIPES.
5. DIRECTIONAL DRILL INSTALLATION SHALL USE TWO SEPARATE COPPER CLAD SOLID STEEL WIRES, 10 GAUGE.
6. CONNECTIONS SHALL BE SNAKE BITE CONNECTORS, OR APPROVED EQUAL
7. REFER TO VOLUSIA COUNTY ELECTRONIC BALL DETAIL

PIPE LOCATING DETAIL

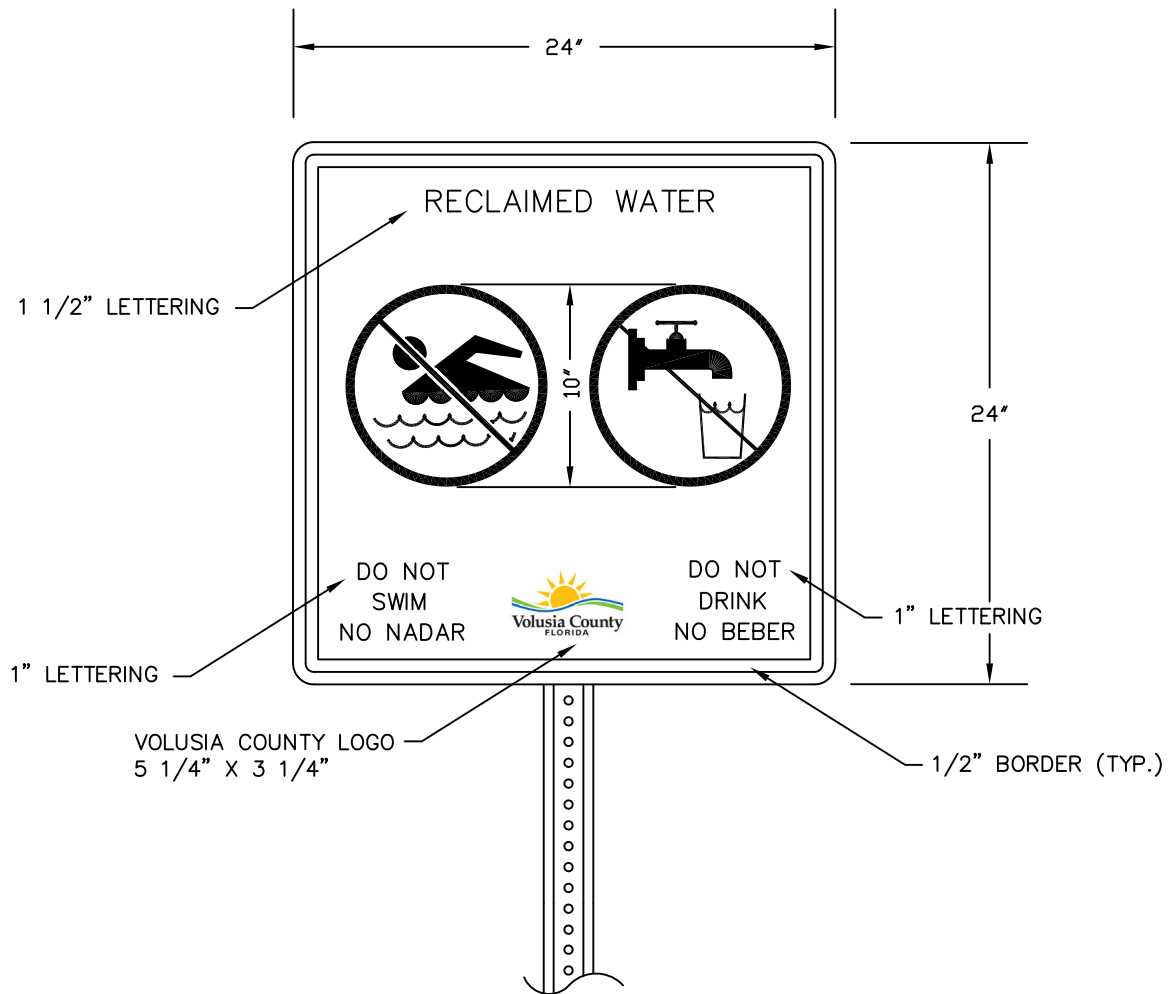
N.T.S.



NOTES

1. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE VISIBLE TO THE PUBLIC.
2. BACKGROUND SHALL BE 3M SCOTCHLITE 710 PROCESS COLOR OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
3. SIGN LETTERS SHALL BE REFLECTIVE MATERIALS EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
4. POST SHALL BE U CHANNEL, 2 LB. HOT ROLLED HIGH TENSILE RAIL OR OR BILLET STEEL WITH GALVANIZED FINISH PER ASTM A-123.
5. MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
6. MINIMUM DEPTH OF BURIAL OF SIGN POST SHALL BE 4'.
7. SIGN BLANK SHALL BE REFLECTIVE ALUMINUM 0.080" THICK.

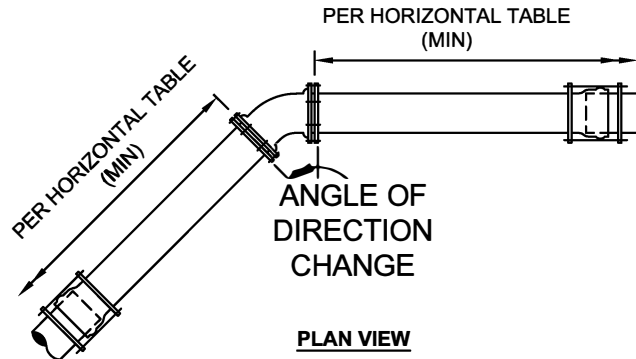
RECLAIMED WATER IRRIGATION SIGN



NOTES

1. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE VISIBLE TO THE PUBLIC.
2. SIGN LETTERS AND GRAPHIC SYMBOLS SHALL BE "PANTONE PURPLE" COLOR OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
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7. SIGN BLANK SHALL BE REFLECTIVE ALUMINUM 0.080" THICK.
8. VOLUSIA COUNTY LOGO SHALL NOT BE A DECAL.

RECLAIMED WATER SIGN



MINIMUM LENGTH (FT) TO BE RESTRAINED ON EACH SIDE OF FITTING(S)

	TYPE	PVC AND DUCTILE IRON PIPE SIZE (IN)													
		4	6	8	12	16	20	24	30	36	42	48	54	60	64
HORIZONTAL	90° BEND														
	45° BEND														
	22-1/2° BEND														
	11-1/4° BEND														
	5 5/8° BEND OR MJ SLEEVE														
	PLUG OR BRANCH OF TEE OR DEAD END														
	VALVE OR LINE STOP														
	HDPE CONNECTION														

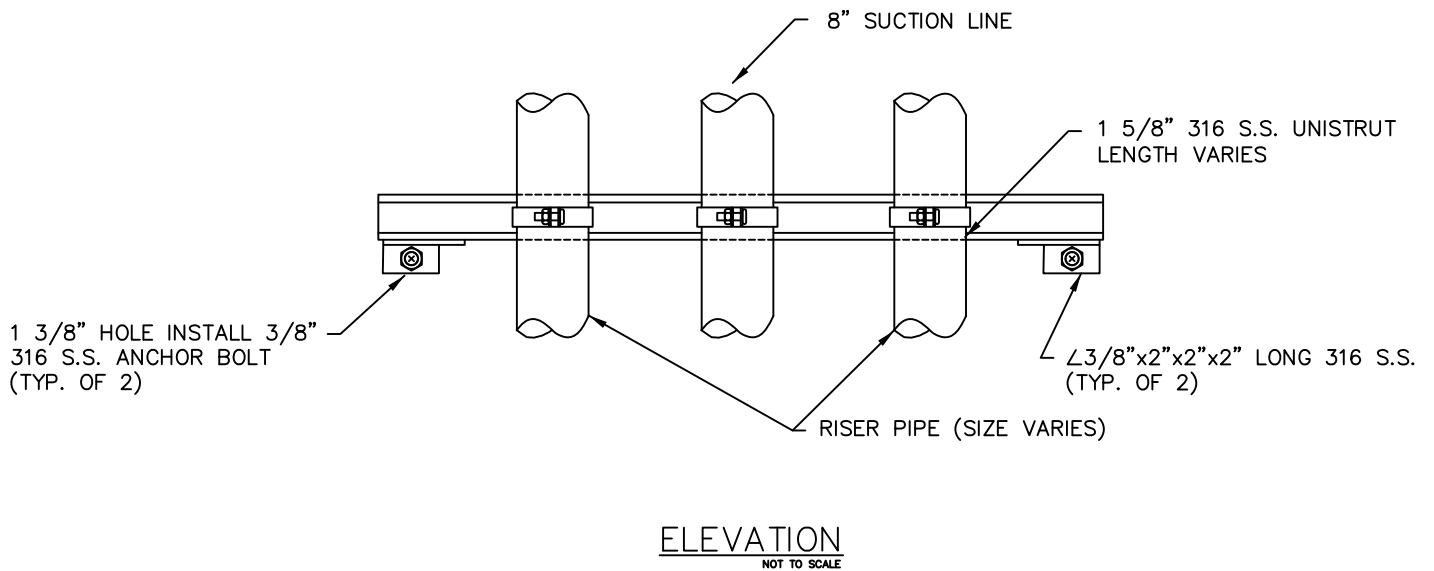
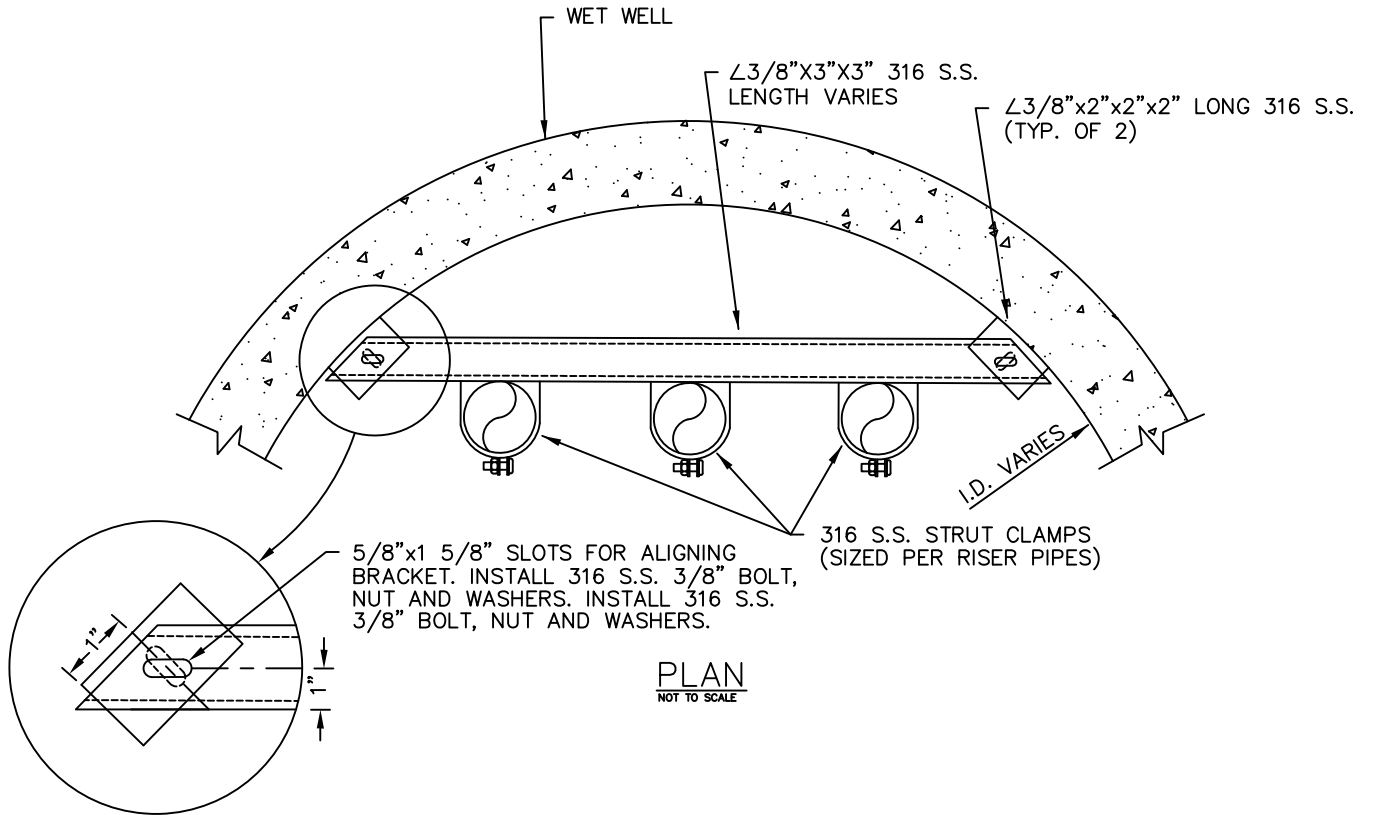
NOTES:

1. FITTINGS SHALL HAVE RESTRAINED JOINTS UNLESS OTHERWISE INDICATED.
2. INSTALL FULL LENGTH JOINTS WITH TOTAL LENGTH EQUAL TO OR GREATER THAN LENGTH SHOWN IN THE TABLE.
3. WHERE TWO OR MORE FITTINGS ARE IN SERIES, SELECT FITTING RESTRAINT LENGTH THAT YIELDS THE LONGEST RESTRAINT DISTANCE.
4. ALL INLINE VALVES SHALL BE RESTRAINED.
5. LENGTHS SHOWN IN THE TABLE SHALL BE CALCULATED IN ACCORDANCE WITH GUIDELINES PUBLISHED BY DIPRA, USING THE ASSUMPTIONS SHOWN BELOW:
 WORKING PRESSURE: 150 PSI
 SOIL DESIGNATION: TBD BY ENGINEER OF RECORD
 LAYING CONDITIONS: TBD BY ENGINEER OF RECORD
 DEPTH OF COVER: 3-FT (min)
 SAFETY FACTOR: 1.5
 THE DESIGN ENGINEER SHALL INCREASE THE VALUES IN THE TABLE AS WARRANTED BY SITE-SPECIFIC PARAMETERS, SUCH AS SOIL DESIGNATIONS AND LAYING CONDITIONS.
6. 90° BENDS ON VERTICAL PIPE ARE SUBJECT TO REVIEW AND APPROVAL OF UTILITIES.
7. IF 4-IN THRU 20-IN PIPE IS POLYETHYLENE ENCASED, USE 1.25 MULTIPLIER ON RESTRAINT LENGTH.
8. RESTRAINING REQUIREMENTS APPLY TO BOTH EXISTING AND PROPOSED MAINS.

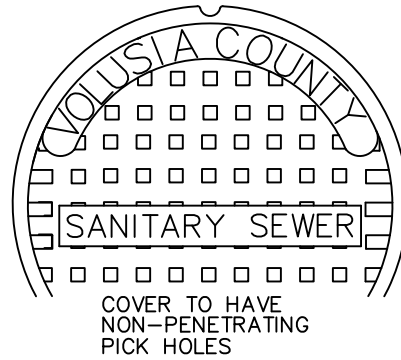
RESTRAINED HORIZONTAL PIPE

N.T.S.

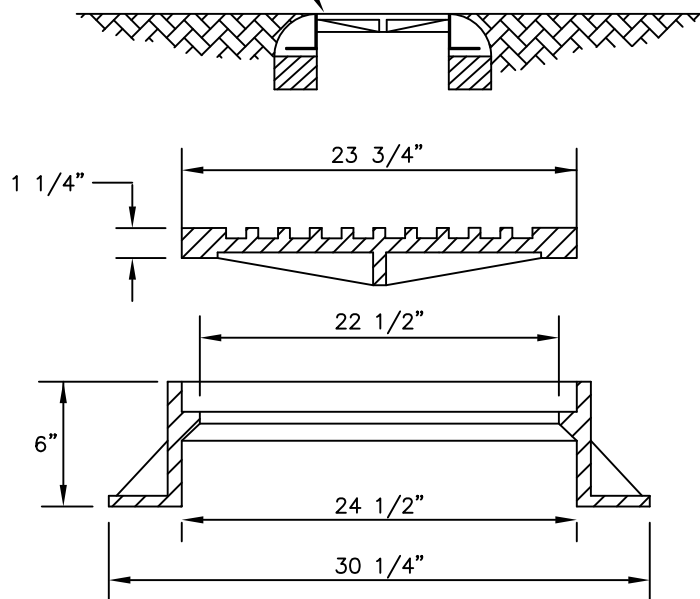
UPDATED JANUARY 2025



RISER PIPE SUPPORT BRACKET DETAIL



SET COVERS FLUSH WITH
FINISHED ASPHALT



FRAME AND COVER TO BE TRAFFIC
BEARING U.S. FOUNDRY #170-E, OR EQUAL.

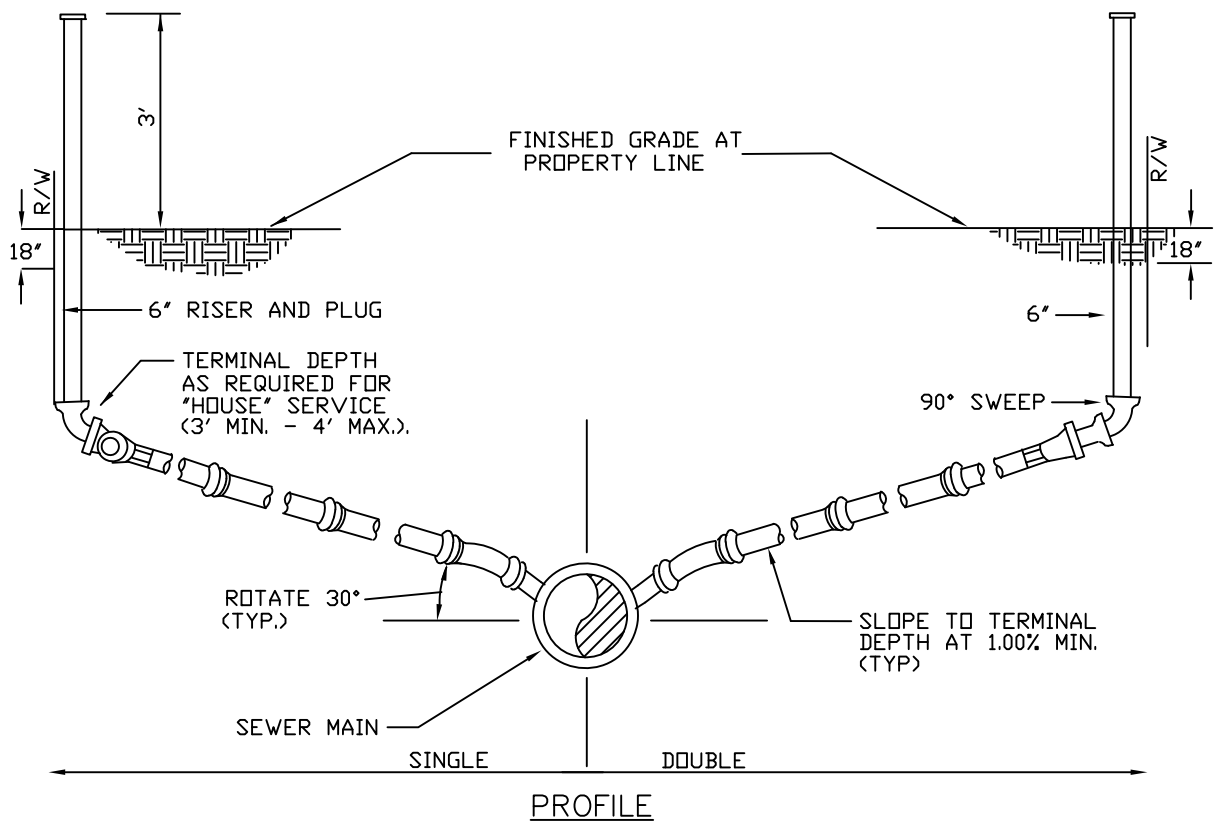
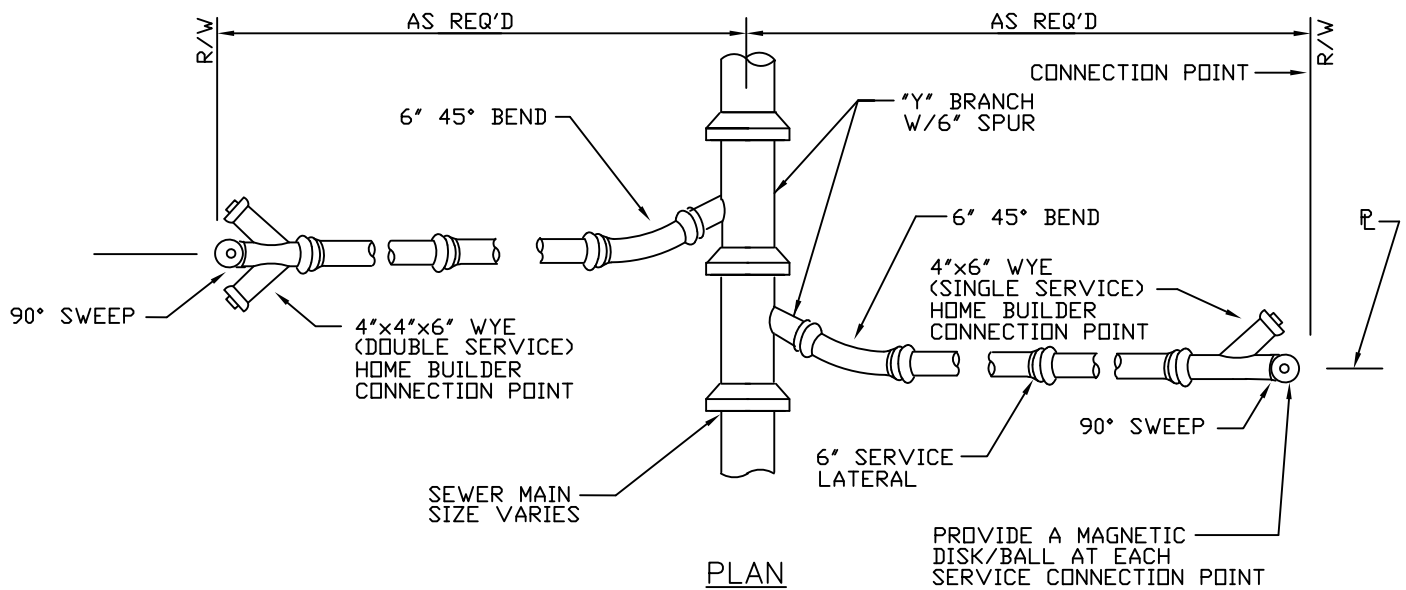
NOTES:

1. FRAME WEIGHT TO BE 150 LBS.
2. COVER WEIGHT TO BE 130 LBS.
3. COVER TO BE MARKED:

VOLUSIA
COUNTY
SANITARY
SEWER

4. WEIGHTS TO BE STAMPED ON
FRAME & COVER.
5. FRAME & COVER TO HAVE
MACHINED SURFACES.

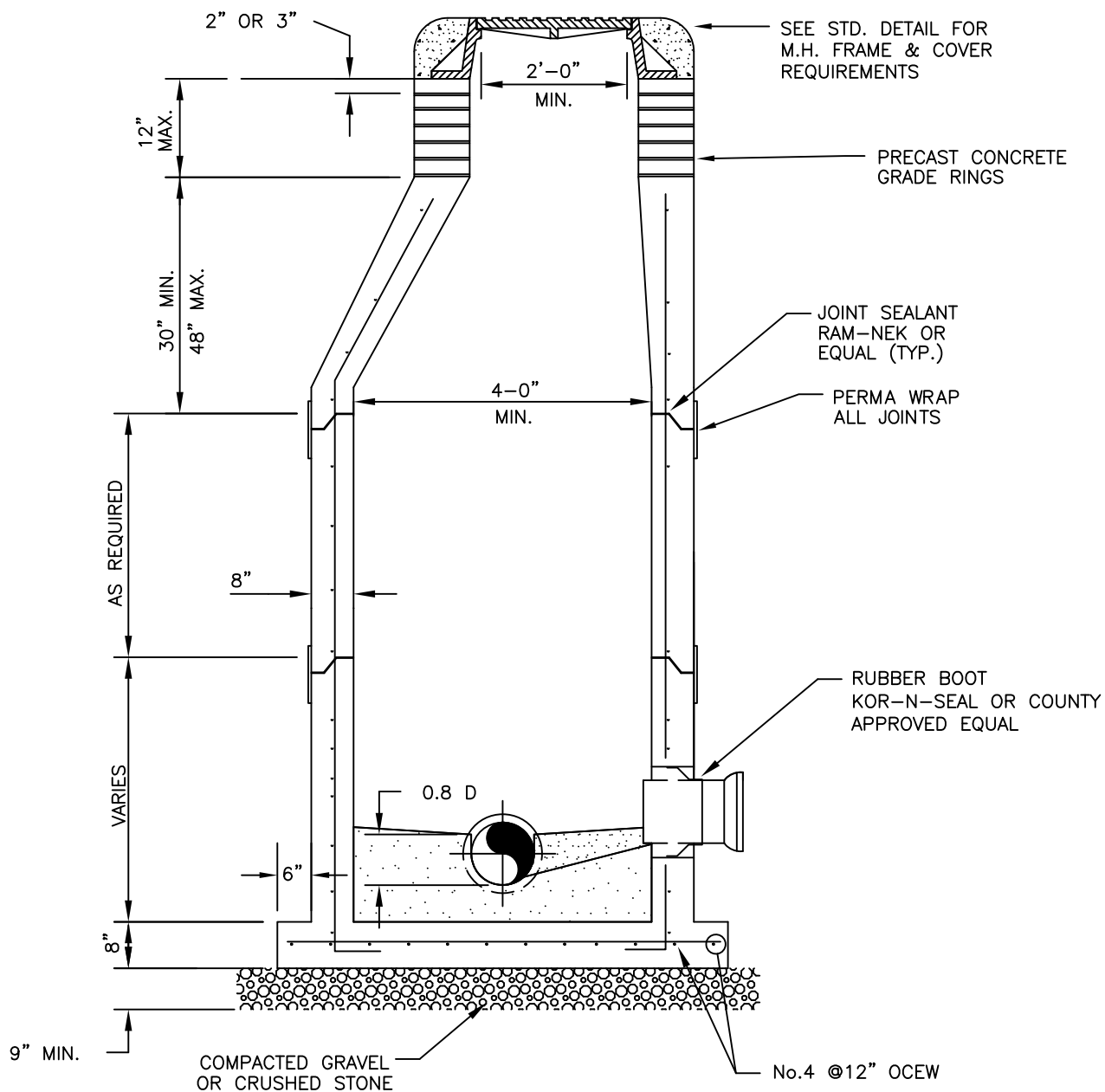
SANITARY MANHOLE
FRAME AND COVER



NOTES:

1. HOME BUILDING SHALL INSTALL A CLEANDOUT TO THEIR CONNECTION POINT.
2. LOCATE SINGLE LATERAL AS CLOSE TO LOT AS POSSIBLE, 25' MAXIMUM.
3. INVERT OF SERVICE LATERAL SHALL NOT PROTRUDE INTO SEWER MAIN.

SANITARY SERVICE LATERAL DETAIL



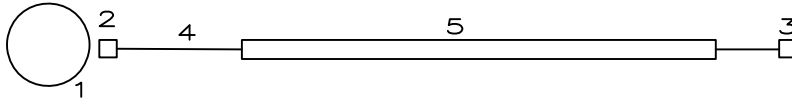
NOTES

1. PRECAST CONCRETE TYPE 2 4000 P.S.I.
2. "RAM-NEK OR EQUAL AT ALL RISER JOINTS(1/2" THICK W/WIDTH AT LEAST 1/2 THE WALL THICKNESS) W/GROUT INSIDE AND OUTSIDE.
3. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
4. FLOW CHANNELS SHALL BE FIELD CONSTRUCTED TO DIRECT FLOW STREAM.
5. LIFT HOLES ARE NOT PERMITTED FURNISH LIFTING CABLES.
6. ALL PIPE HOLES SHALL BE PRECAST OR CORE-DRILLED.
7. RUBBER BOOT MUST BE USED WITH ALL PIPE CONNECTIONS.
8. MANHOLES SHALL BE COATED INSIDE AND OUT WITH TWO COATS OF CS-55 WATER BASED CONCRETE COATING, MIN. 8 MILS PER COAT.
9. MANHOLES RECEIVING FLOW FROM SEWAGE FORCE MAINS SHALL BE ARMOROCK OR APPROVED EQUAL. MANHOLES LOCATED WITHIN 100 FEET OF A SEWER LIFT STATION SHALL BE ARMOROCK OR APPROVED EQUAL.

STANDARD MANHOLE DETAIL

SINGLE SET, METER SET FOR 5/8", 3/4" AND 1" METERS

SINGLE SERVICE SET (WATER AND RECLAIM)

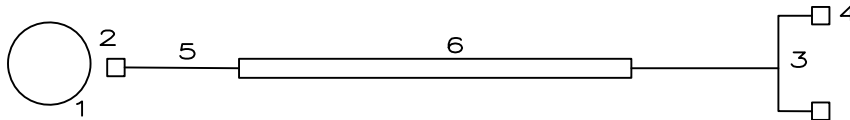


NO POLYTUBING UNDER ROAD ALLOWED WITHOUT 2" CASING

1. 1" TAPPING SADDLE CC THREAD, EPOXY COATED WITH STAINLESS STEEL STRA.
2. 1" CORPORATION STOP FORD FB1000-4-G (1" BALLVALVE, INLET, OUTLET) MUELLER EQUAL.
3. 1" CURB STOP, FORD B43-342W-NL (3/4" VALVE, 1" INLET PE END PACK JOINT-CTS, MUELLER EQUAL (THIS IS FOR 5/8" AND 3/4" METER SET). IF 1" METER SET USE FORD CURB STOP B41-344W-NL.
4. 1" 200 PSI, SDR 9 ENDOT ENOPURE BLUE WATER SERVICE TUBING (POTABLE), PURPLE (RECLAIMED) WITH TRACER WIRE AND SNAKE BITE CONNECTORS.
5. 2" PVC SCHEDULE 40, CASING PIPE WHITE, IF INSTALLATION UNDER ROAD (PAVED OR DIRT).

DOUBLE SET OR DUAL SET

METER SET FOR 5/8" AND 3/4" METERS (WATER ONLY)

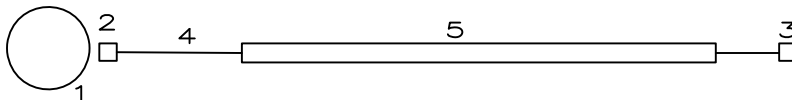


NO POLYTUBING UNDER ROAD ALLOWED WITHOUT 2" CASING

1. 1" TAPPING SADDLE CC THREAD, EPOXY COATED WITH STAINLESS STEEL STRAP.
2. 1" CORPORATION STOP FORD FB1000-4-G (1" BALLVALVE, INLET, OUTLET) MUELLER EQUAL.
3. 1" X 3/4" U BRANCH PACK JOINT-CTS FORD U48-43-NL 7.5 OR MUELLER H1460.
4. 3/4" CURB STOP, FORD B13-332W-NL OR MUELLER EQUAL.
5. 1" 200 PSI, SDR 9 ENDOT ENOPURE BLUE WATER SERVICE TUBING (POTABLE), PURPLE (RECLAIMED) WITH TRACER WIRE AND SNAKE BITE CONNECTORS.
6. 2" PVC SCHEDULE 40, CASING PIPE WHITE, IF INSTALLATION UNDER ROAD (PAVED OR DIRT).

2" WATER SERVICE CONNECTION FOR 1 1/2" AND 2" METER SETS

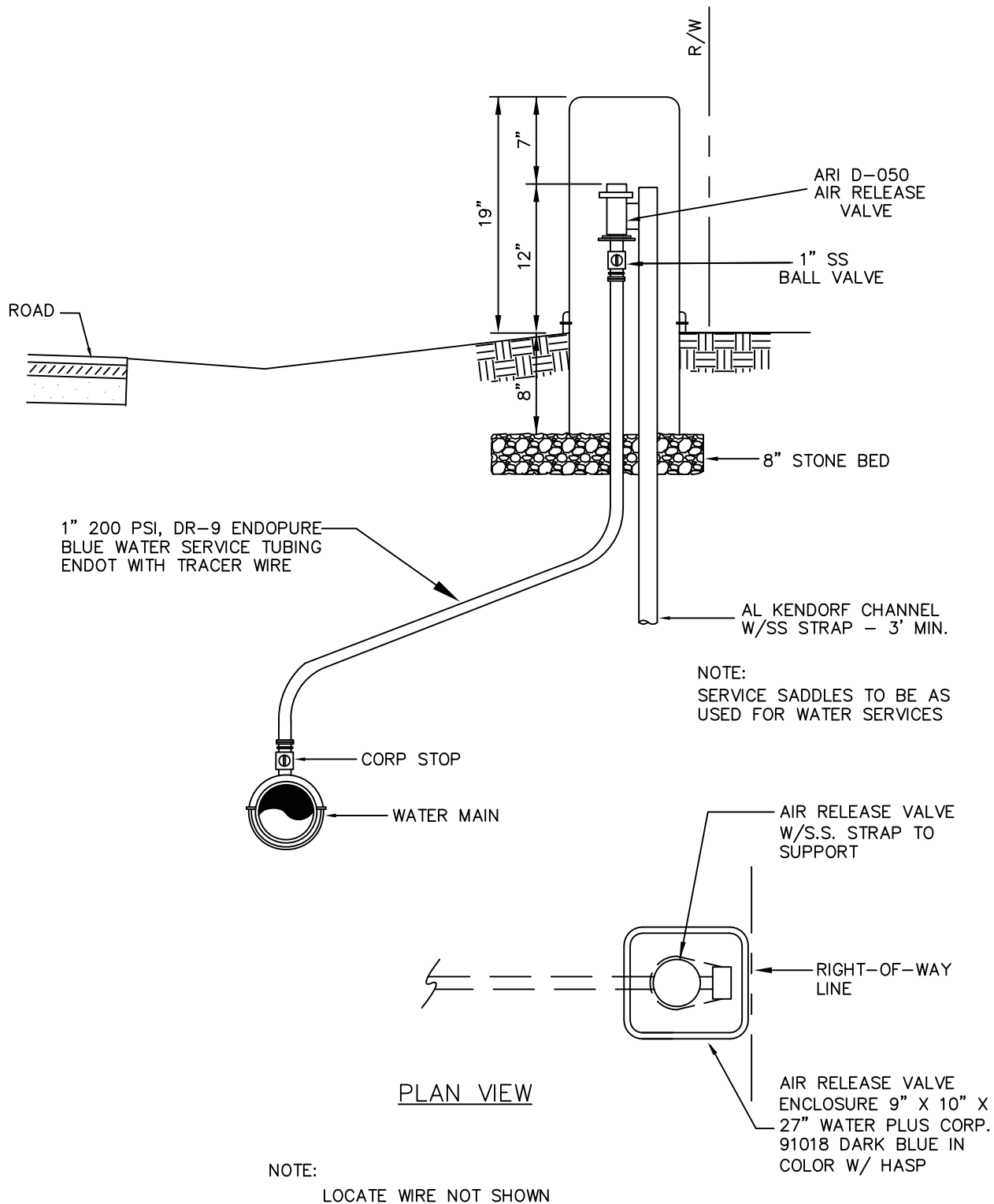
(WATER AND RECLAIM)



NO POLYTUBING UNDER ROAD ALLOWED WITHOUT 4" CASING

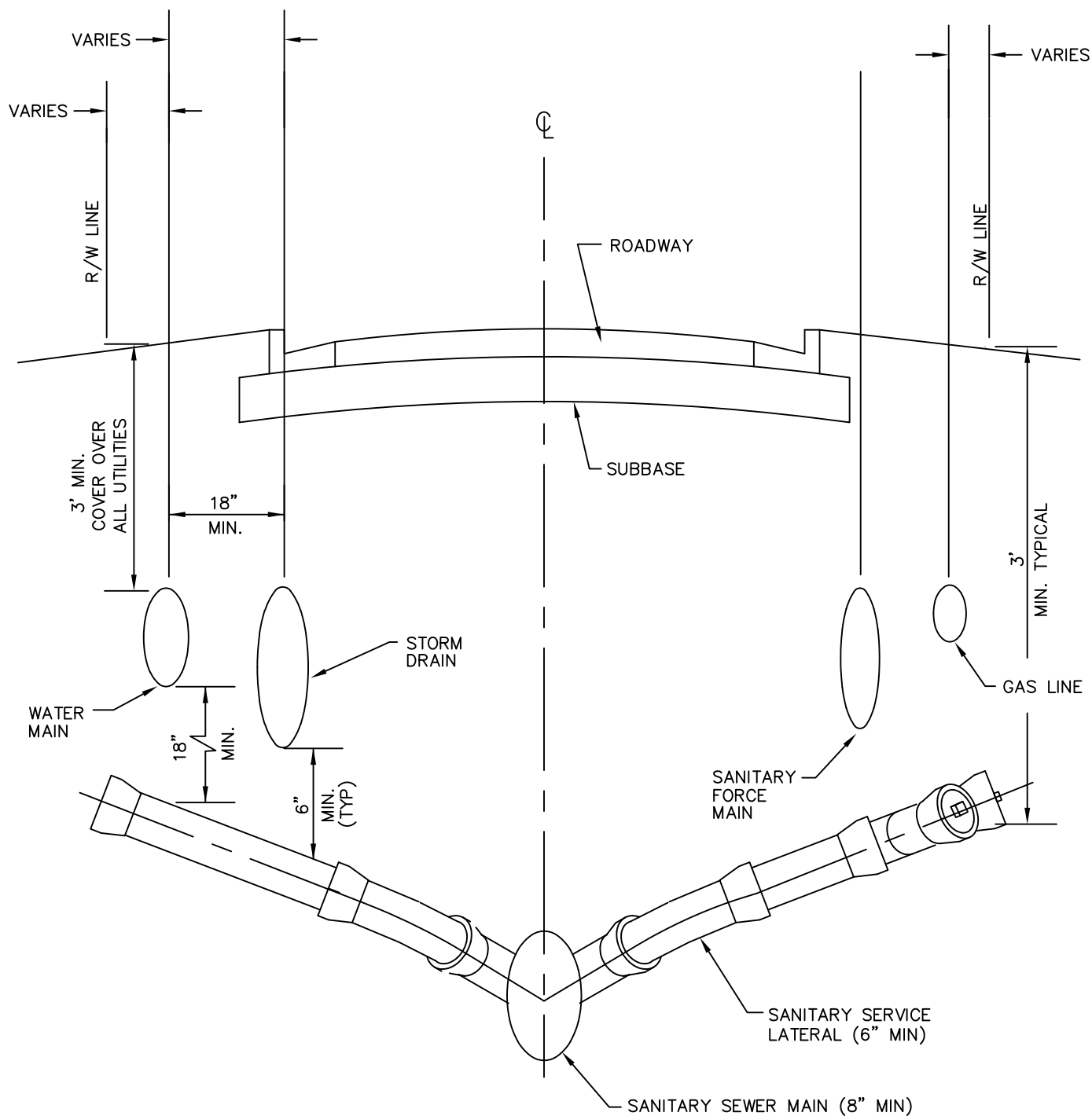
1. 2" TAPPING SADDLE CC THREAD, EPOXY COATED WITH STAINLESS STEEL STRAP,
2. 2" CORPORATION STOP FORD FB1101-7-G (2" BALLVALVE X IPT X CTS) MUELLER EQUAL..
3. 2" CURB STOP, BF43-777W-NL (2" VALVE, 2" CTS X 2" FLANGE) FLANGE WILL FIT 1 1/2" OR 2" FLANGE WATER METER.
4. 2" 200 PSI, SDR 9 ENDOT ENOPURE BLUE WATER SERVICE TUBING (POTABLE), PURPLE (RECLAIMED) WITH TRACER WIRE AND SNAKE BITE CONNECTORS.
5. 4" PVC SCHEDULE 40, CASING PIPE WHITE, IF INSTALLATION UNDER ROAD (PAVED OR DIRT).

WATER & RECLAIMED SERVICE DETAIL



TYPICAL WATER MAIN **AIR-RELEASE VALVE INSTALLATION**

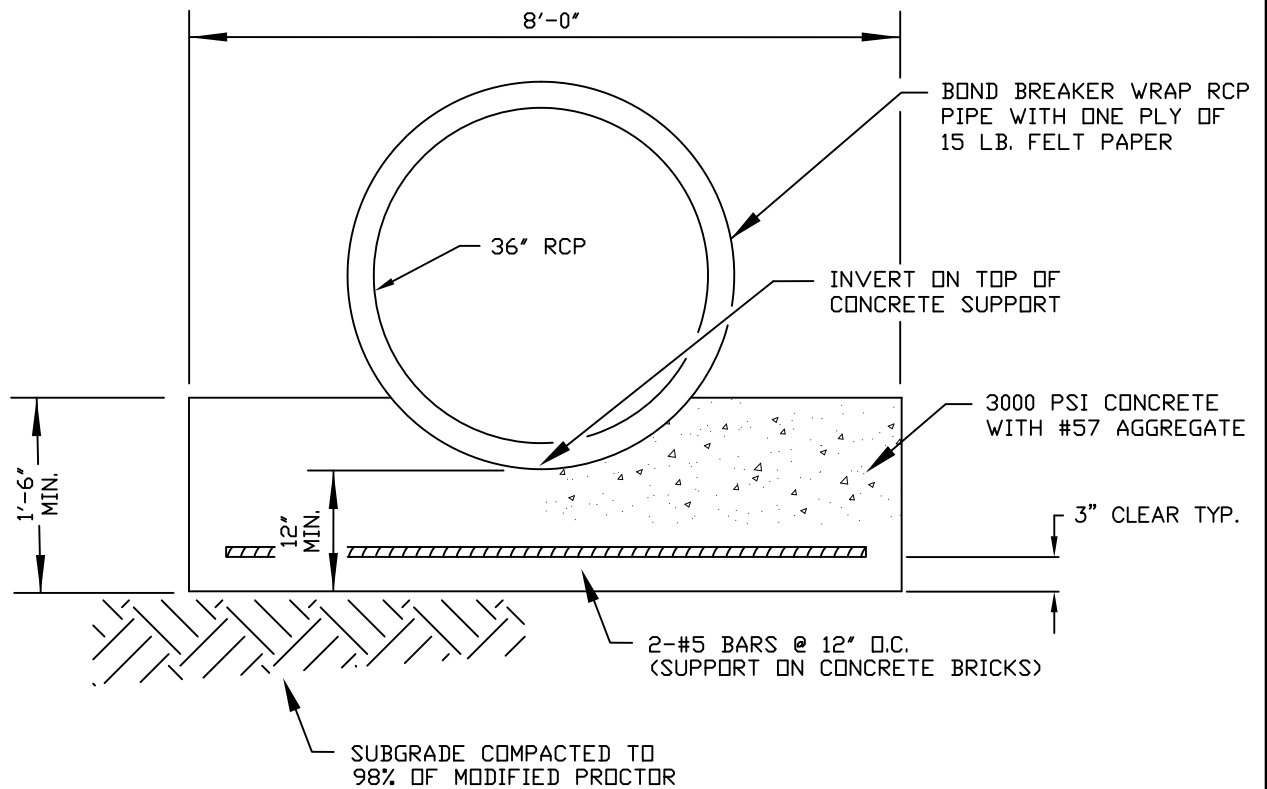
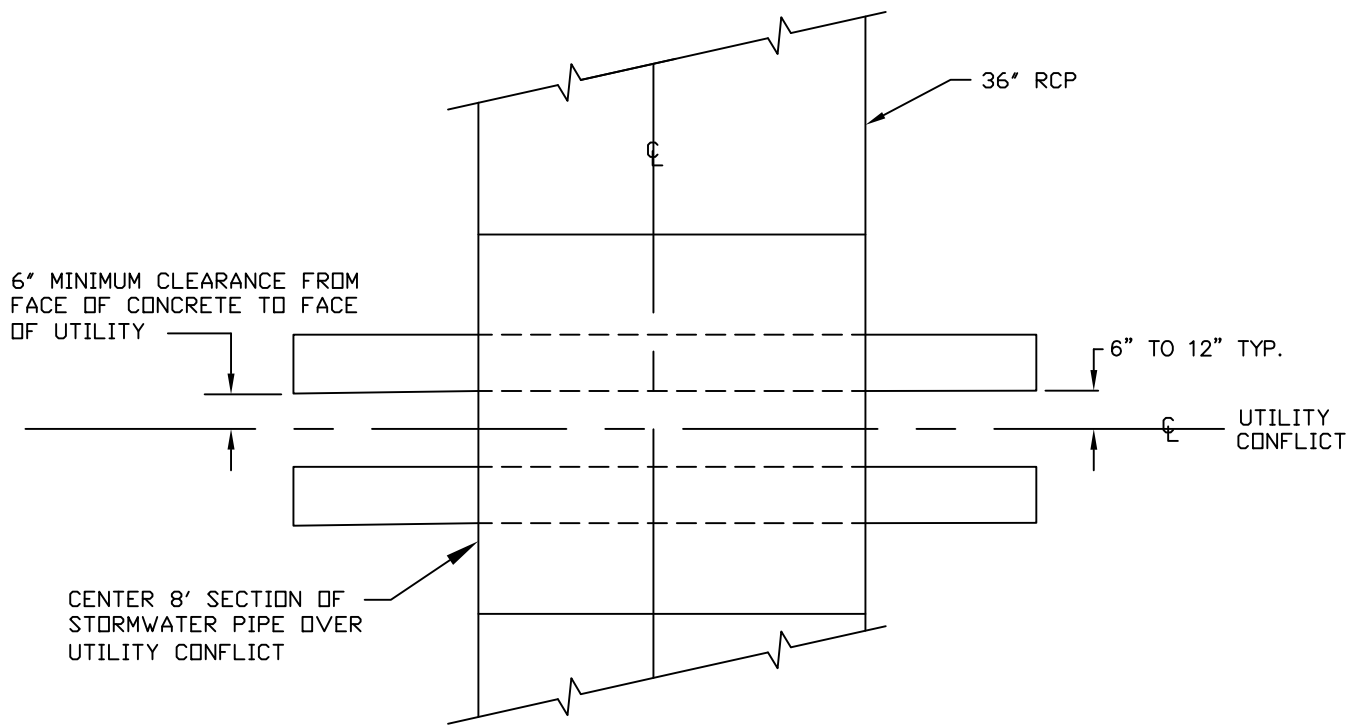
NTS



NOTES

1. STORM DRAIN MAY BE LOCATED ON EITHER SIDE OF ROAD.
2. SANITARY SEWER SERVICES ARE TO BE LAID OVER OR UNDER STORM DRAINS AS REQUIRED.
3. SANITARY SERVICE LATERAL SHALL HAVE A MINIMUM SLOPE OF 1.0%.
4. SANITARY SERVICE LATERALS TO BE A MINIMUM OF 6" DIA.
5. 18" SEPARATION SHALL BE MAINTAINED BETWEEN ALL PIPES WHEN POSSIBLE.

TYPICAL UNDERGROUND UTILITIES LOCATION

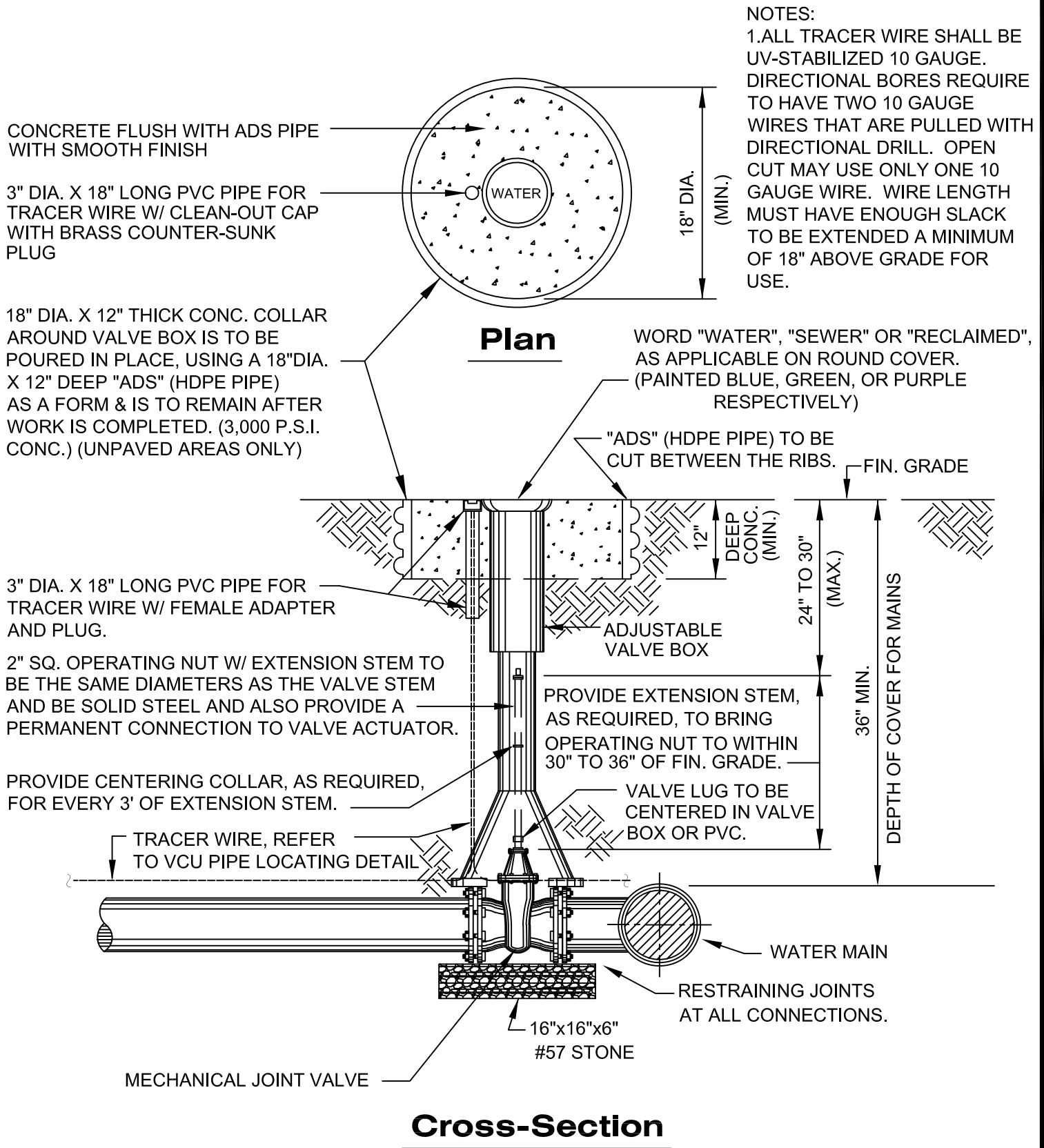


NOTES:

1. MAINTAIN MINIMUM VERTICAL CLEARANCE FROM BOTTOM OF STORM PIPE TO TO TOP OF UTILITY CONFLICT PIPE.

UTILITY CONFLICT RCP DETAIL

N.T.S.

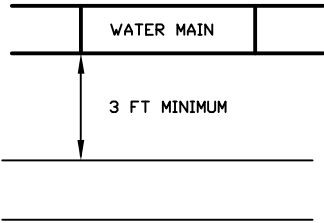
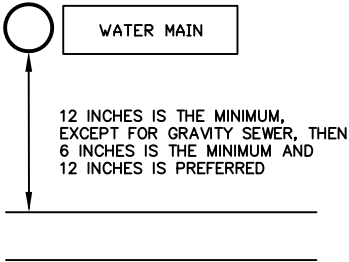
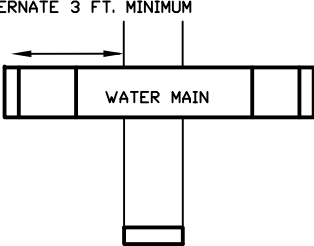
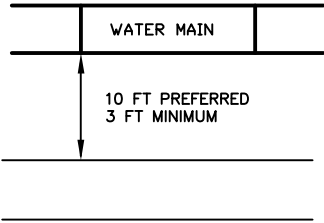
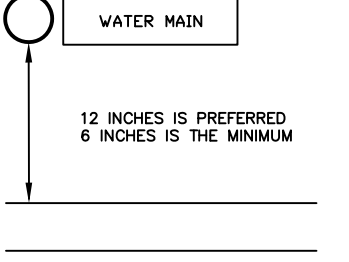
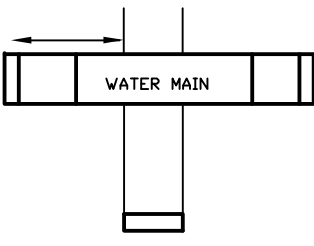
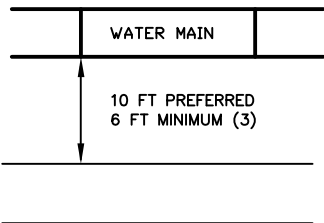
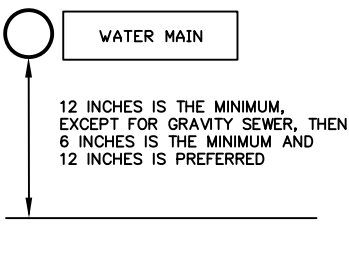
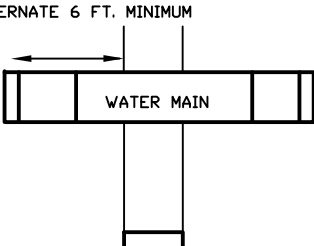


NOTES:

1. ALL TRACER WIRE SHALL BE UV-STABILIZED 10 GAUGE. DIRECTIONAL BORES REQUIRE TO HAVE TWO 10 GAUGE WIRES THAT ARE PULLED WITH DIRECTIONAL DRILL. OPEN CUT MAY USE ONLY ONE 10 GAUGE WIRE. WIRE LENGTH MUST HAVE ENOUGH SLACK TO BE EXTENDED A MINIMUM OF 18" ABOVE GRADE FOR USE.

VALVE AND BOX DETAIL

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

OTHER PIPE	HORIZONTAL SEPARATION	CROSSINGS (1)	JOINT SPACING @ CROSSINGS (FULL JOINT CENTERED)
STORM SEWER, STORMWATER FORCE MAIN, RECLAIMED WATER (2)	 <p>3 FT MINIMUM</p>	 <p>12 INCHES IS THE MINIMUM, EXCEPT FOR GRAVITY SEWER, THEN 6 INCHES IS THE MINIMUM AND 12 INCHES IS PREFERRED</p>	 <p>ALTERNATE 3 FT. MINIMUM</p>
VACUUM SANITARY SEWER	 <p>10 FT PREFERRED 3 FT MINIMUM</p>	 <p>12 INCHES IS PREFERRED 6 INCHES IS THE MINIMUM</p>	 <p>ALTERNATE 3 FT. MINIMUM</p>
GRAVITY OR PRESSURE SANITARY SEWER SANITARY SEWER FORCE MAIN, RECLAIMED WATER (4)	 <p>10 FT PREFERRED 6 FT MINIMUM (3)</p>	 <p>12 INCHES IS THE MINIMUM, EXCEPT FOR GRAVITY SEWER, THEN 6 INCHES IS THE MINIMUM AND 12 INCHES IS PREFERRED</p>	 <p>ALTERNATE 6 FT. MINIMUM</p>
ON-SITE SEWAGE TREATMENT & DISPOSAL SYSTEM	10 FT MINIMUM		

- 1. WATER MAIN SHOULD CROSS ABOVE OTHER PIPE. WHEN WATER MAIN MUST BE BELOW OTHER PIPE, THE MINIMUM SEPARATION IS 12 INCHES.
- 2. RECLAIMED WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.
- 3. 3 FT. FOR GRAVITY SANITARY SEWER WHERE THE BOTTOM OF THE WATER MAIN IS LAID AT LEAST 6 INCHES ABOVE THE TOP OF THE GRAVITY SANITARY SEWER.
- 4. RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.

WATER MAIN SEPARATION DETAIL

SEPARATION REQUIREMENTS:

1. A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET OUTSIDE SHALL BE MAINTAINED BETWEEN WATER MAINS AND SANITARY GRAVITY SEWER OR STORM SEWER LINES. (SEE DETAIL "A")
2. A MINIMUM HORIZONTAL SEPARATION OF THREE (3) FEET OUTSIDE TO OUTSIDE SHALL BE MAINTAINED BETWEEN WATER MAINS AND RECLAIMED WATER LINES CARRYING UNRESTRICTED PUBLIC ACCESS REUSE WATER OR WELL SUPPLY MAINS.
3. THERE SHALL BE AT LEAST A TEN (10) FOOT SEPARATION BETWEEN NEW WATER MAINS AND NEW SANITARY SEWER FORCE MAINS WITHOUT EXCEPTION. FIELD PROBLEMS SHALL BE REPORTED TO THE ENGINEER. SPECIAL SOLUTIONS MUST BE ACCEPTED BY D.E.P. PRIOR TO IMPLEMENTATION.
4. A MINIMUM VERTICAL SEPARTION OF EIGHTEEN (18) INCHES OUTSIDE TO OUTSIDE SHALL BE MAINTAINED BETWEEN WATER MAIN AND THE HAZARD LINES (I.E. SANITARY GRAVITY SEWER, STORM SEWER OR RECLAIMED WATER LINES). ONE FULL LENGTH OF PIPE SHALL BE CENTERED AT THE POINT OF CROSSING FOR BOTH PIPES.
5. THERE SHALL BE AN EIGHTEEN (18) INCH VERTICAL SEPARATION BETWEEN NEW WATER MAINS AND NEW SANITARY SEWER FORCE MAINS AT CROSSING WITHOUT EXCEPTION. WHERE IT IS NOT POSSIBLE TO MAINTAIN THE REQUIRED SEPARATION, CONFLICTS WITH EXISTING LINES SHALL BE REPORTED TO THE ENGINEER. SPECIAL SOLUTIONS MUST BE ACCEPTED BY D.E.P. PRIOR TO IMPLEMENTATION. AT PIPE CROSSINGS, THE PIPES SHALL BE SITUATED SUCH THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM EACH OTHER.
6. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SANITARY SEWER MANHOLE OR STORM SEWER STRUCTURE.

SOLUTIONS TO SEPARATION CONFLICTS

1. IN AREAS WHERE IT IS NOT PRACTICAL TO MAINTAIN THE REQUIRED SEPARATION. THE WATER MAIN MUST BE LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SANITARY GRAVITY SEWER, STORM SEWER OR RECLAIMED WATER LINE AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE OTHER LINE. (SEE DETAIL "B")
2. IF THE MINIMUM ALLOWABLE (10') HORIZONTAL SEPARATION OR 18" VERTICAL IN A SEPARATE TRENCH CANNOT BE MAINTAINED, UPGRADE THE WATER MAIN TO DUCTILE IIRON IF THE OTHER LINE IS A STORM SEWER OR AN EXISTING SANITARY GRAVITY SEWER.
3. IF THE NON-CONFORMING LINE IS A NEW GRAVITY SANITARY SEWER, AND 10' HORIZONTAL SEPARATION OR 18" VERTICAL SEPARATION IN A SEPARATE TRENCH CANNOT BE MAINTAINED, THEN:
 - A. PLACE THE HAZARD LINE WITHIN A CONCRETE SEALED PVC SDR 35 CARRIER PIPE. (SEE DETAIL "C")
 - B. ENCASE THE HAZARD PIPE IN CONCRETE ENCASEMENT. DETAIL THIS SHEET
 - C. UPGRADE THE NEW GRAVITY SANITARY SEWER TO AWWA C-900, D.R. 18 PVC AND HYDROSTATICALLY TEST IT TO 150 PSI. AT PIPE CROSSINGS, THE PIPES SHALL BE SITUATED SUCH THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM EACH OTHER.
4. IF THE HAZARD LINE IS A RECLAIMED WATER LINE AND THE ABOVE SEPARATION REQUIREMENTS ARE NOT MET, UPGRADE THE RECLAIMED WATER LINE MATERIAL TO DUCTILE IRON OR ENCASED PIPE IN CONCRETE.
5. WHEN THERE IS LESS THAN 18" OF VERTICAL CLEARANCE BETWEEN THE WATER MAIN AND STORM SEWER, AT THE POINT OF CROSSING. (SEE DETAIL "D")
6. WHEN THE WATER MAIN CROSSES BELOW THE HAZARD LINE, THE WATER MAIN SHALL HAVE A MINIMUM VERTICAL SEPARATION OF 18" FROM THE HAZARD LINE. ONE FULL LENGTH OF PIPE SHALL BE CENTERED AT THE POINT OF CROSSING (FOR BOTH PIPES WHEN CROSSING SANITARY SEWER). (SEE DETAIL "E")
7. SPECIAL STRUCTURAL SUPPORT OR CONCRETE SADDLES MAY BE NECESSARY AT THE CROSSING LOCATION.
8. IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE CROSSING HAZARD. RECEIVE SPECIFIC APPROVAL BY D.E.P. PRIOR TO IMPLEMENTATION.

WATER MAIN SEPARATION NOTES

UTILITY RECORD DRAWING REQUIREMENTS

The DEVELOPER'S ENGINEER shall submit a certified set of Record Drawings to the COUNTY prior to issuance of Certificate of Completion for the improvements. The DEVELOPER'S ENGINEER shall be responsible for recording information on the approved PLANS concurrently with construction progress. Record Drawings submitted to the COUNTY as part of the project acceptance shall comply with the following requirements:

1. Drawings shall be legible marked to record actual construction.
2. Drawings shall show actual location of all underground and above ground water and wastewater piping related appurtenances. All changes to piping location including horizontal and vertical locations of utilities and appurtenances shall be clearly shown and referenced to permanent surface improvements. Drawings shall also show actual installed pipe material, class, etc.
3. Drawings shall clearly show all field changes of dimension and detail including changes made by field order or by change order.
4. Drawings shall clearly show all details not on original contract drawings but constructed in the field. All equipment and piping relocation shall be clearly shown.
5. At each manhole, fitting, hydrant, service line at yoke, valve, and valve box location, provide an item callout with type, size, material, invert, grade elevation, GPS point, etc. Dimensions between each manhole shall be field verified and provided on the respective plan sheet. Each manhole, valve, service line at yoke, and fire hydrant shall be marked on the record drawing with GPS coordinates in the item callout. Additionally, a separate electronic spreadsheet file shall be submitted to include each item description and size with GPS coordinate. This data will be referenced in the Florida State Plane Coordinate System, East Zone in US Survey Feet. The horizontal datum is NAD83/(1990) HARN and the vertical datum is NAVD 88 Feet, in accordance with Florida Statutes, Chapter 177.151.

Each sheet of the PLANS shall be signed, sealed and dated by the DEVELOPER'S ENGINEER as being "Record Drawings". Construction PLANS simply stamped "As-Built" or "Record Drawings" and lacking in above requirements will not be accepted, and will be returned to the DEVELOPER'S ENGINEER. The "Certificate of Completion" will not be issued until correct "Record Drawings" have been submitted.

Two (2) blue-line prints and a digital file containing a complete set of "Record Drawing" as accepted by the COUNTY along with digital copies of all permits and clearances shall be provided. Digital documents shall be .dwg (AutoCAD) and a digitally signed and sealed PDF file.